THE PAPER INDUSTRY and PAPER WORLD

AN EDUCATIONAL NEWS MAGAZINE—JULY, 1948

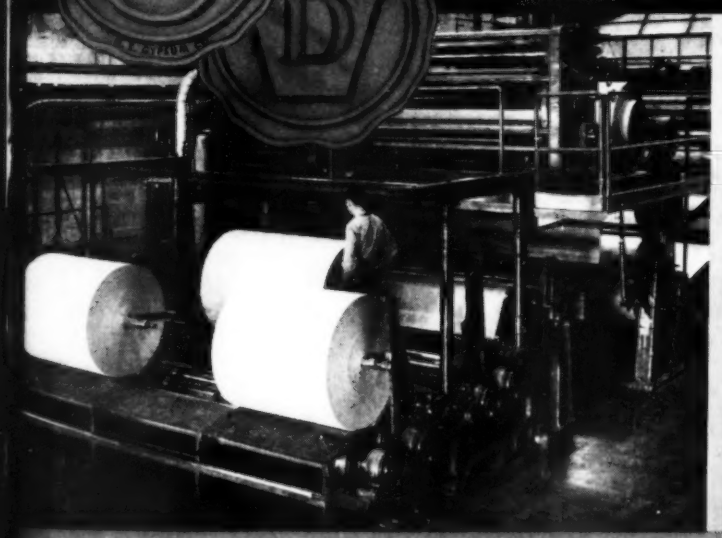
PUBLIC LIBRARY
JUL 31 1948
DETROIT

COMPLETE MANUFACTURING EQUIPMENT FOR 2 MILLS OF UNITED STATES GYPSUM CO.

DESIGNED AND BUILT OR FURNISHED

4 · Waste Paper Conveyors
4 · Hydrapulpers
7 · Classifiners
16 · Jordans
4 · Hydrofiners
28 · Screens (Packer)
18 · Mix Boxes

CONTRACT UNIQUE

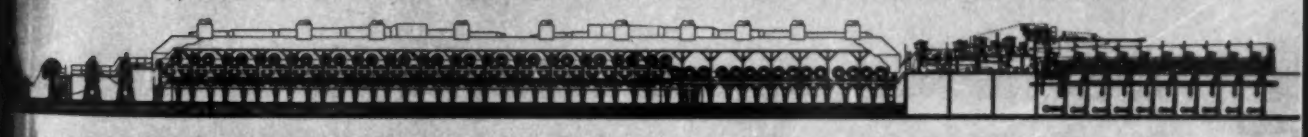


2 · High Capacity Cylinder Machines
18 · Vats and Hoppers
16 · Suction Rolls
215 · Dryers
4 · Calender Stacks
2 · Sectional Motor Drives
2 · Complete Piping Systems
121 · Pumps
390 · Motors

DOWNINGTOWN MANUFACTURING CO.
Downingtown, Pa.

Designers and Builders—Paper Making Machinery

World's Largest Combination Felt and Liner Board Machine and World's Largest Cylinder Board Machine—10 Vats (1 Felt Vat) 124 Dryers at the Clark (New Jersey) Mill of United States Gypsum Co. Machine at South Gate (California) Mill is identical, except that it has 8 Vats (1 Felt Vat) and 91 Dryers. Note machine arrangement with four operating levels.



count on UFORMITES 470 and 467 for an effective job at low cost

It's a simple matter to impart high wet strength to glassine for frozen food wrappings ... or to other papers... when you use the UFORMITES.

If you're using Kraft stock for bag and wrapping papers, toweling, food wrappings or map papers, just add UFORMITE 467 at the beater.

Or if you're working with sulfite, rag or groundwood stocks ... making glassine, sulfite wrapping paper, absorbent tissues, chart and ledger papers ... then add UFORMITE 470 at the Jordan or head box.

No special equipment—no special handling with the UFORMITES! As little as 1% resin solids on dry fibre weight boosts wet strength *as much as 300%*. Dry tensile, Mullen, fold, uniformity of sizing and coating surface characteristics are all substantially improved too. And there's no effect on color, odor or taste of paper!

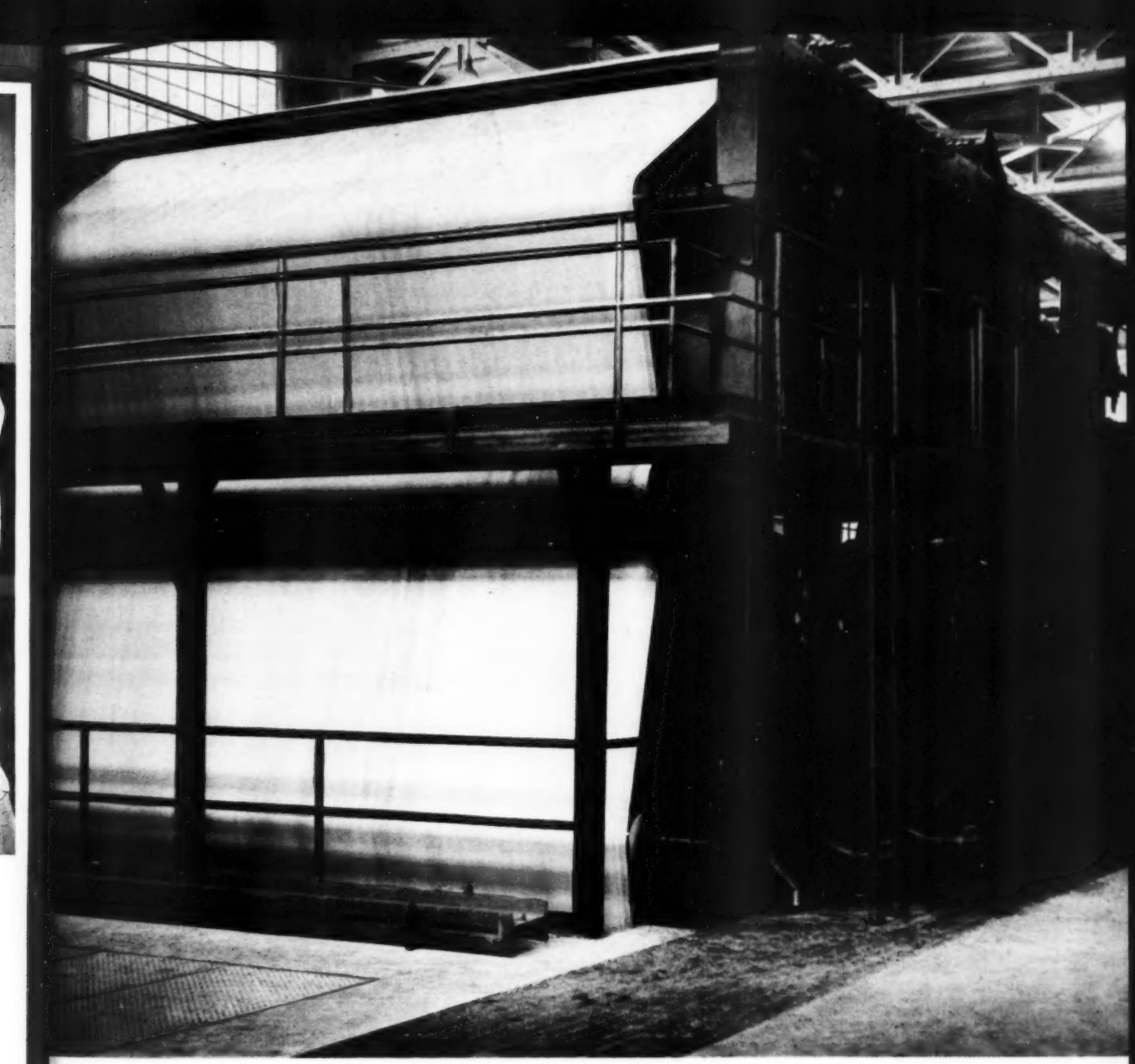
Get the full facts today!

UFORMITE *is a trade-mark, Reg. U. S. Pat. Off.*

Represented by Cia. Rohm y Haas, S.R.L., Carlos Pellegrini 331, Buenos Aires, Argentina, and agents in principal South American cities

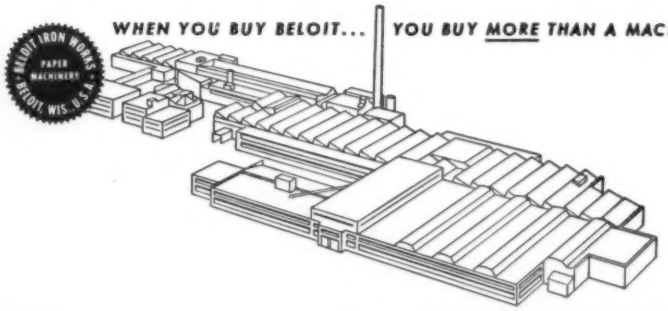
THE RESINOUS PRODUCTS & CHEMICAL COMPANY

WASHINGTON SQUARE, PHILADELPHIA 5, PA.



Better finish, drier sheet

The short top felt arrangement of this Beloit machine assures better cylinder machine operation. Among the many advantages are reduced felt cost, better finish, and drier sheet. On existing machines, this type of arrangement is ideal for saving space, usually permitting installation of an additional vat if desired. Installation shown is at Alton Box Board Company, Alton, Ill. *Beloit Iron Works, Beloit, Wis.*

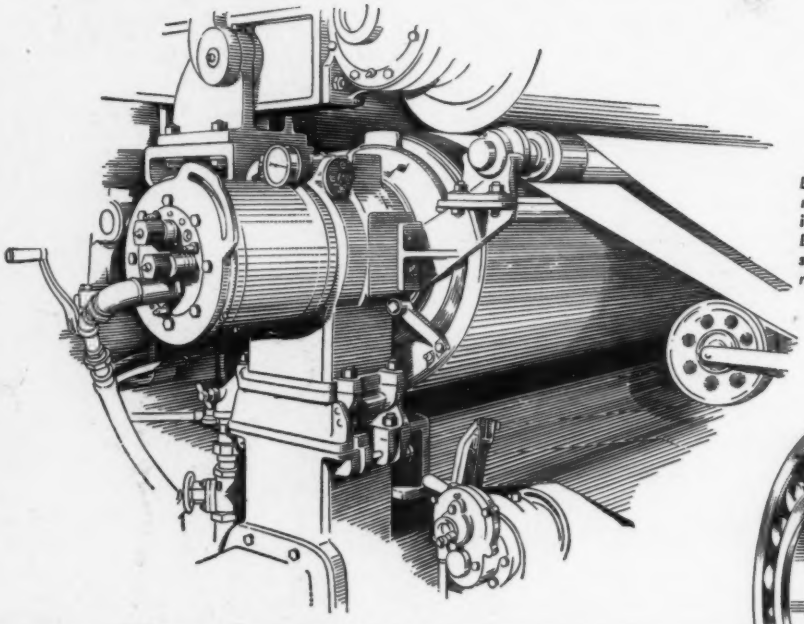


WHEN YOU BUY BELOIT... YOU BUY MORE THAN A MACHINE!

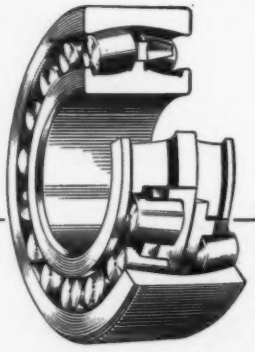
BELOIT

PAPER MACHINERY

BELOIT-built Equipment Assures Reliable Operation with TORRINGTON Spherical Roller Bearings



Dependable performance of Torrington Spherical Roller Bearings in suction press roll built by Beloit Iron Works is assured by self-aligning feature and high radial and thrust capacity.



... long service life with a minimum of service attention—another advantage of these precision bearings.

A MASTERPIECE OF DESIGN in every detail, the Beloit suction press roll demands good bearing design and performance. For day to day dependable operation, the low friction coefficient and precision tolerances of Torrington Self-Aligning Spherical Roller Bearings assure smooth starting and running. High radial capacity and two-directional thrust capacity also provide long service life with minimum maintenance.

These are only a few of the many benefits which result from the use of Torrington Spherical Roller Bearings in exacting applications to your calender rolls, screens, paper dryers, chippers, beaters and Jordan engines.

You also benefit from the years of experience of Torrington's engineers in the design, construction and application of all major types of anti-friction bearings. For specialized assistance on any bearing requirement, call or write the nearest Torrington office.

THE TORRINGTON COMPANY
South Bend 21, Ind. • Torrington, Conn.
District Offices and Distributors in Principal Cities

TORRINGTON *SPHERICAL ROLLER* **BEARINGS**

SPHERICAL ROLLER · TAPERED ROLLER · STRAIGHT ROLLER · NEEDLE · BALL · NEEDLE ROLLERS

Sutherland FIRST

About twelve years ago, the "then" astounding news leaked out that kraft paper was being made from stock prepared alone by Sutherland Continuous Beaters and Refiners. It had never been done before; some people didn't believe it, but it's been true ever since.

The original 14 Sutherlands in this mill are still in use, one more having been recently added. This mill produces well over 500 tons daily, their output ranging from 30 to 70 lb. bag, through 25 to 80 lb. wrapping, to 42 to 105 lb. liner board, and other specialty grades.

This is only one of many "Sutherland Firsts," and it produced a power saving of approximately 50% which, over a period of twelve years, has brought them a "substantial" return on their original investment, plus other advantages.

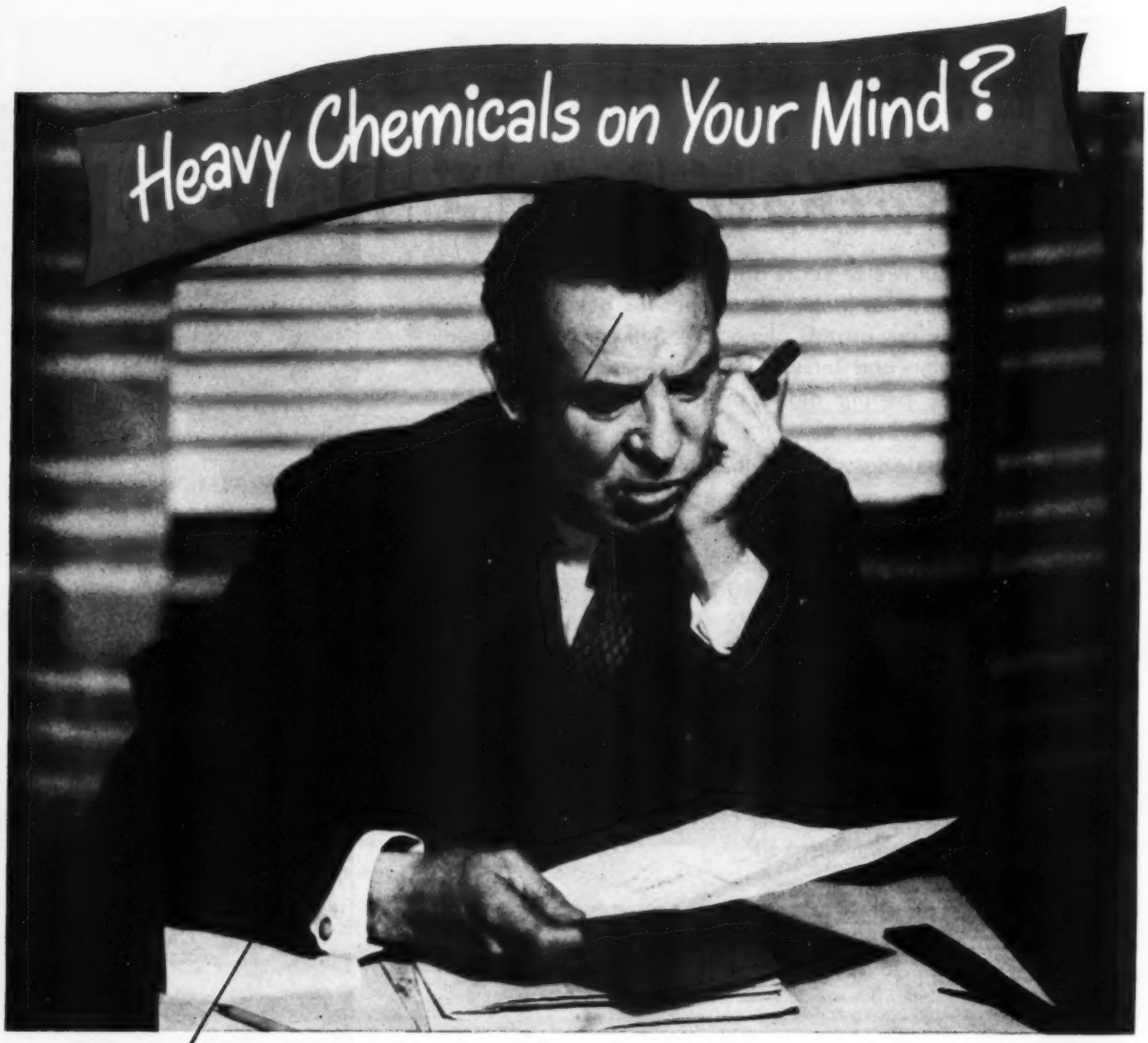
May we send you our new catalog, or may one of our engineers call?

SUTHERLAND REFINER CORPORATION

TRENTON, NEW JERSEY • *Manufactured in the United States by Valley Iron Works Co., Appleton, Wis*

SUTHERLAND REFINER LIMITED, 319 DRUMMOND BLDG., MONTREAL, P. Q. Manufactured in Canada by The John Bertram & Sons Co., Ltd., Dundas, Ontario

SUTHERLAND



★ try Mathieson

We can give you facts on the supply situation that may save you time—the latest trends . . . what's doing in consumer industries . . . how shifting areas of distribution may affect your supplies . . . the possibilities offered by expansion in heavy chemical production.

Such information—including Mathieson's ability to supply you—is yours for the asking. So, if heavy chemicals are on your mind, why not get in touch with us? Mathieson Chemical Corporation, 60 East 42nd Street, New York 17, N. Y., *formerly The Mathieson Alkali Works (Inc.)*

Mathieson
CHEMICALS

Caustic Soda . . . Soda Ash . . . Bicarbonate of Soda . . . Liquid Chlorine . . . Chlorine Dioxide . . . Ammonia, Anhydrous & Aqua . . . HTH Products . . . Fused Alkali Products . . . Dry Ice . . . Carbonic Gas . . . Sodium Chlorite Products . . . Sodium Methylate

THE PAPER INDUSTRY and PAPER WORLD

(Reg. U. S. Pat. Off.)

VOLUME 30 - - - - JULY 1948 - - - - NUMBER 4

—FEATURES—

Insulating Techniques at New Kraft Mill of Brown Company ..... A. L. Sargent 563

New Sulphate Pulp Mill Gives Brown Company Integrated Process 567

Magnetic Drives For Paper Mills ..... G. L. Oscerson 574

Paper Research and Technology at the National Bureau of Standards—Part II ..... Bourdon W. Scribner 577

Convention Papers . . . Abridged 616

—NEWS—

Forming the Sheet 514

Trade Winds 515

Allied 583

Safety 592

Associations 594

Names in the News 598

Personals 598

Necrology 610

—DEPARTMENTS—

Editorial 553

Between the Lines 554

Paper Sketches 582

Coming Events 597

Practical Shorts 613

New Equipment and Supplies 640

Technical Developments 648

New Publications 650

Current Market Quotations 654

Index to Advertisers 657

Published monthly by FRITZ PUBLICATIONS, INC., 59 East Van Buren Street, Chicago 5, Illinois

EDWARD B. FRITZ Founder	A. SCOTT DOWD President and Gen. Mgr.	A. C. BRUCE Secretary	BESSE MERRITHEW Editor
A. C. L. FRITZ Vice Pres. and Treas.	EDGAR C. FARREN Production Manager	G. E. VON ROSEN Circulation Director	C. J. ELWELL Circulation Field Rep.

ADVERTISING REPRESENTATIVES

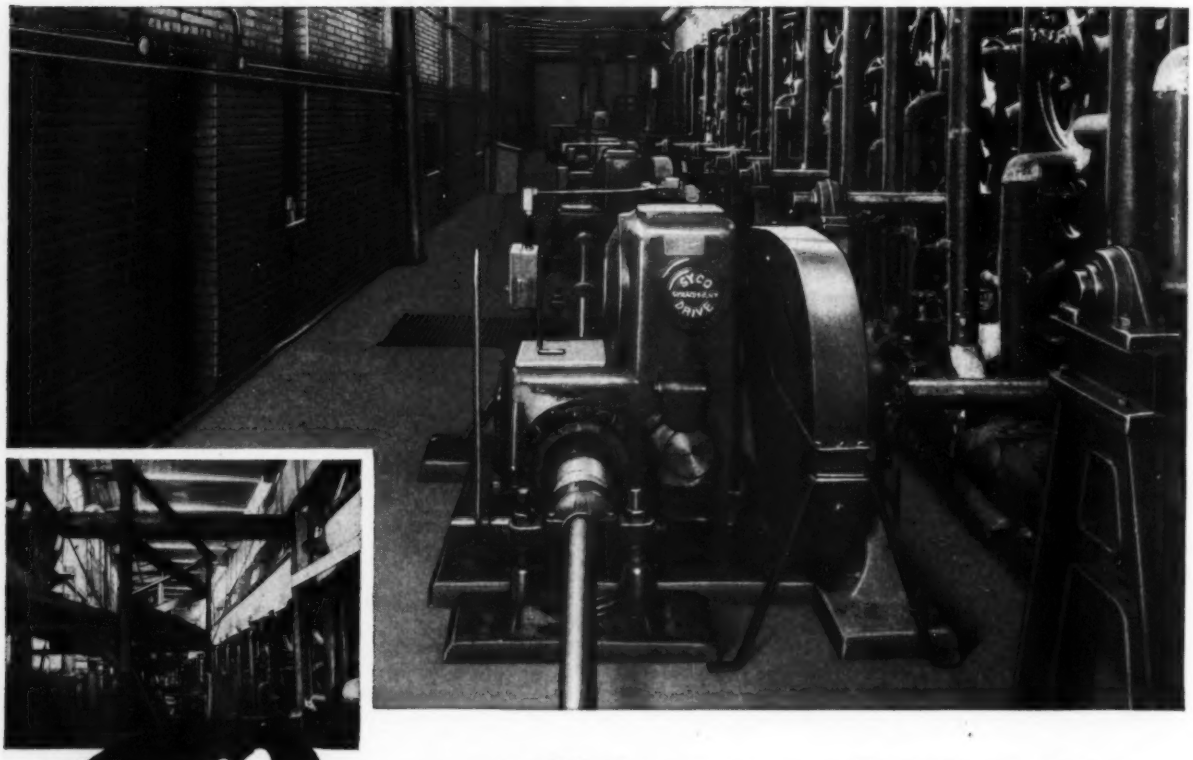
New York • RAYMOND S. VAN NYDECK • 9 Rockefeller Plaza • Circle 7-3085 • New York 20, N. Y.
Boston • MEADE AND COMPANY • 471 Statler Building • Liberty 9677 • Boston 16, Mass.
Cleveland • L. M. PERKINS • 1199 Dorsh Road • Evergreen 3232 • South Euclid 21, Ohio
Chicago • JOHN D. HENDERSON • 59 E. Van Buren Street • Wabash 3543 • Chicago 5, Illinois
Los Angeles • NOURSE ASSOCIATES • 412 West 6th Street • Vandike 5875 • Los Angeles 14, Calif.

THE PAPER INDUSTRY and PAPER WORLD is indexed regularly in "The Industrial Arts Index." An index to each volume is issued annually by the publisher as Section Two of the April number.
Copyright 1948 by Fritz Publications, Inc.

Member:
Audit Bureau of Circulation
Associated Business Papers, Inc.

Entered as second class matter June 29, 1938, at the post office at Chicago, Ill., under the Act of March 3, 1879; additional entry at Mount Morris, Ill., March 19, 1948. Subscriptions in the United States, U. S. Possessions, Canada, Cuba and Mexico, $2.00 for one year, $3.00 for two years. All other countries $3.00 for one year, $5.00 for two years.

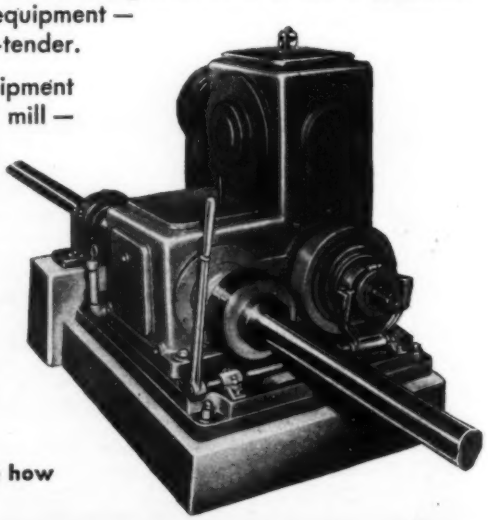
Like More Floor Space Around Your Machine?



SYCO **Saves Half the Space of Other Drives**

The modern SYCO Paper Machine Drives save 50%, or more, of the space used by old style drives. The clean, compact, soundly-engineered SYCO Drive unit is self-contained. Just one glance at a SYCO installation reveals usable space available for auxiliary equipment — how safely accessible the paper machine is to the back-tender.

With Modern SYCO Drives, there is no drive equipment below or above the floor-level. You have a "clean" mill — uncluttered with overhead shafts, pulleys, idlers, counter-shafts and belts, guards for belts and gears, superstructure, ladders or catwalks.

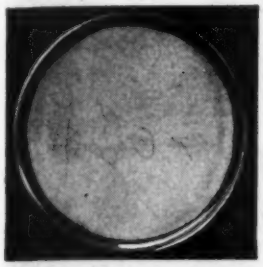


Even more important is the better performance of your paper machine with SYCO Drive. The close, accurate speed control is easily adjusted — holds the individual sections in precise speed ratio — preserves uniform tension on the sheet at all times. This means smooth running, fewer interruptions — and increased production.

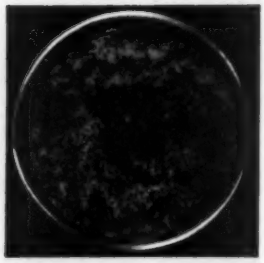
Write for full information on the SYCO Drives — see how readily they can be applied to your machine.

SYCO MANUFACTURING CORP., 324 West Fayette St., SYRACUSE, N.Y.

It's your decision...



profit or loss



DOWICIDES make the difference!

You can keep bacteria and fungi out of your operations—reduce the losses they cause—with the Dowicides.

In the pulp, paper and paper-board industries—where processing conditions foster bacterial and fungus growth—the Dowicides do an extremely effective job. They afford ideal protection against mildew and rot . . . they ward off bacterial decomposition on lap stock and machine felts. They also provide a final mold resistant treatment when used in sizing and coating materials and act as preservatives for starches, casein, glue, and other decomposable adhesives.

If mold and bacteria are cutting *your* profits, get in touch with the nearest Dow Office. We welcome the opportunity to discuss your problems with you.

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Washington • Cleveland • Detroit
Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle
Dow Chemical of Canada, Limited, Toronto, Canada

CHEMICAL COMMENTS

DOW PRODUCES ESSENTIAL AMINO ACIDS SYNTHETICALLY

Science over many years has discovered the real body builders—the amino acids, which make up protein. Dow research has found a way to produce all the essential amino acids *synthetically*. Two of the acids, methionine and tryptophan, are in volume production. Others are available in sufficient quantities to meet present experimental demands of the pharmaceutical and animal feed industries. Recently Dow announced substantial price reductions on quantity orders of methionine and tryptophan. This was in accordance with the policy of this company to expand production and reduce prices as rapidly as possible on the essential amino acids in order that their benefits may be more widely available in the fields of nutrition and chemotherapy.

2-4 DOW WEED KILLER, FORMULA 40 IDEAL FOR LOW VOLUME APPLICATION

2-4 Dow Weed Killer, Formula 40 (an alkanolamine salt formulation) is bad news for weeds in turf, pastures, corn, flax, rice, sugar cane and small grains. It mixes readily with water in any proportion and can be used effectively in very low volume applications, in 5 to 20 gallons of water per acre by ground equipment or 1 to 5 gallons by airplane. Control of many common annual and perennial weeds is achieved through its use.

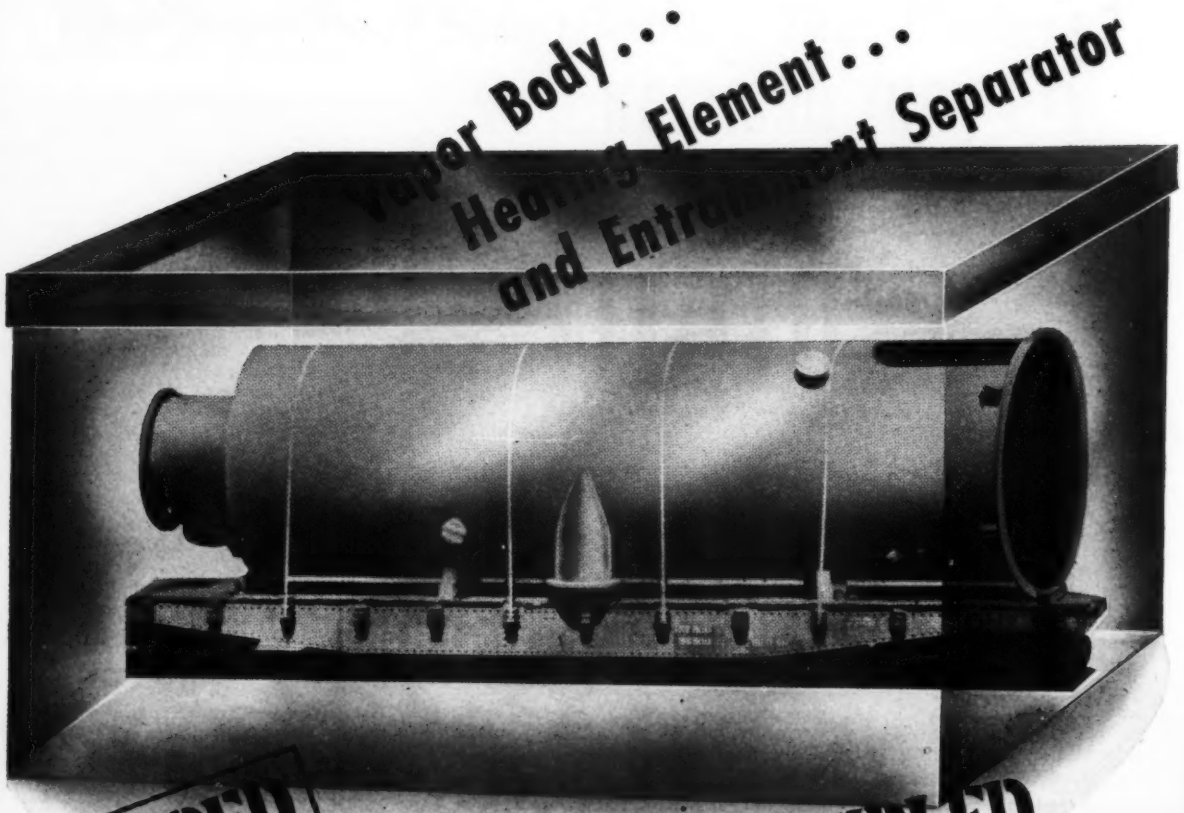
NEW "TOOL" FOR THE PERFUME BLENDER

Creative perfumers are finding Sylvenol, Dow's powerful Aromatic Specialty, capable of countless interesting effects in modern and oriental perfumes. Sylvenol is a viscous, amber-colored liquid that has an odor definitely of the precious wood type, imitative of sandalwood, cedarwood, patchouli and vetiver. Besides its woody character, Sylvenol reminds one of orris and high grade ionones suggesting its use in compounds to which it will impart intensity and life.

Additional information about any of these products is available on request.

DOW

CHEMICALS INDISPENSABLE TO INDUSTRY AND AGRICULTURE



SHIPPED COMPLETELY ASSEMBLED

Conkey Self-Supporting Evaporator Effects are shipped to you as a unit, with vapor body, heating element, and entrainment separator completely assembled. Thus, upon arrival at the site, it swings into place just as simply as you would erect any tower. Once you get a derrick over it, the job is practically done.

As its name implies, this new evaporator requires no structural supports, and thus it needs less floor space than conventional types of identical capacity. It needs no special housing, and may be set up out of doors if climatic conditions permit.

Ask a General American engineer to give you further information on other installation and operating advantages of this type of evaporator.

OTHER GENERAL AMERICAN EQUIPMENT

DIGESTERS
TURBO-MIXERS
KILNS
STORAGE TANKS
SLAKERS
RECAUSTICIZING PLANTS
BLOW TANKS
FILTERS
THICKENERS
BINS
SIZERS

GENERAL AMERICAN TRANSPORTATION CORPORATION

Process Equipment Division

SALES OFFICE: 10 East 49th St., Dept. 820a, New York 17, N. Y.

WORKS: Sharon, Pa., East Chicago, Ind.

OFFICES: Chicago, Cleveland, Louisville, Orlando, Pittsburgh, St. Louis, Salt Lake City, Sharon, Washington, D. C.

PROCESS EQUIPMENT DIVISION GENERAL AMERICAN TRADE MARK

Speed PRODUCTION Reduce OPERATING COSTS

More and more leading paper mills are using Yarway Motor-Operated Digester Valves on the blow lines from pulp digesters to blow tanks.

Economy and speed of operation are two main reasons.

The famous Yarway *Seatless* principle assures a *tight* valve—effectively sealing off the digester, preventing loss of black liquor, increasing number of cooks per day. The simple push button motor control at top of digester means speed.

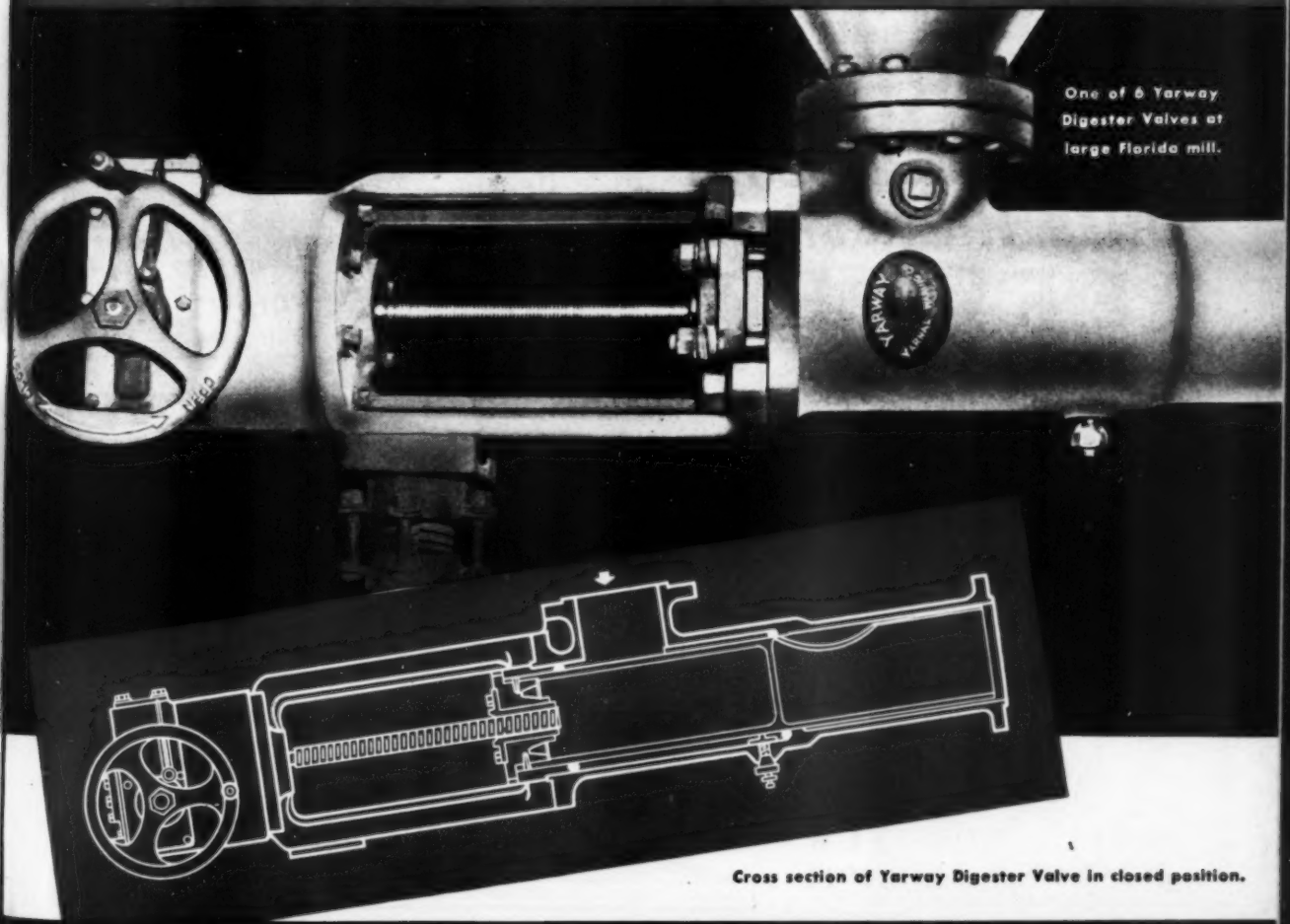
Metallurgical advancements also permit Yarway Digester Valves to withstand the pressure, shock and chemical action always encountered in this service.

In one mill, Yarways increased production 1½ to 2 cooks per day while reducing operating supervision. Another reports maintenance is lower than on any other type of valve for this service.

For more information on these valves, write . . .

YARNALL-WARING COMPANY
149 Mermaid Avenue, Philadelphia 18, Pa.

WITH YARWAY *SEATLESS* DIGESTER VALVES



One of 6 Yarway Digester Valves at large Florida mill.

Cross section of Yarway Digester Valve in closed position.

YARWAY BLOW-OFF VALVES

SUBJECT

Refining of Kraft pulp for high grade cylinder board sheet.

QUALITY

COST

EQUIPMENT

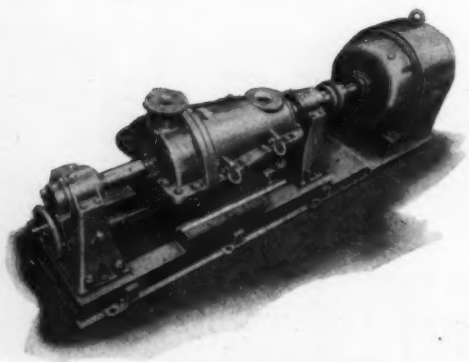
One JONES HIGH-SPEED REFINER supplementing beaters.

RESULTS

1. Beating time reduced from 24 to 12 hours.
2. Power savings nearly 50%.
3. Greatly improved sheet.

REPORT

on new installation of JONES HIGH-SPEED REFINER



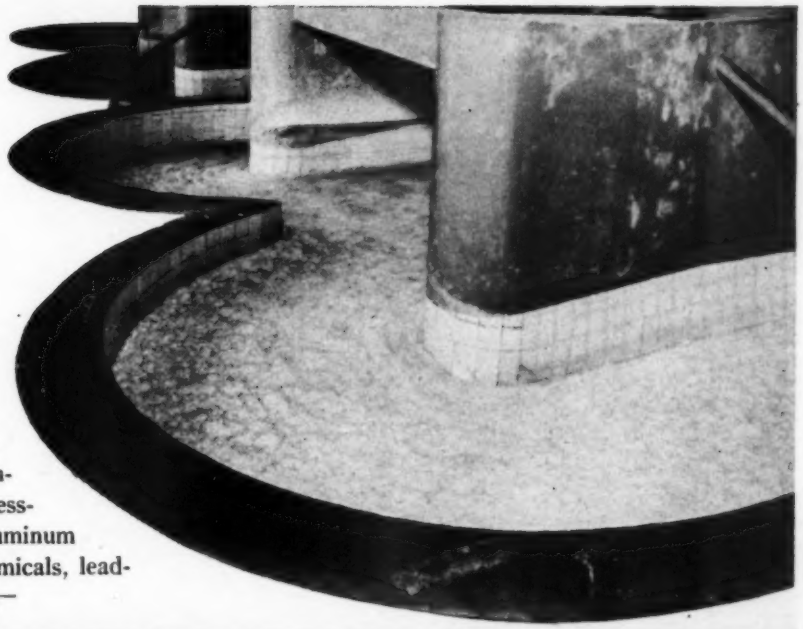
WRITE FOR NEW BULLETIN No. EDJ-1011

Jones

E. D. JONES & SONS COMPANY-PITTSFIELD, MASS.
Builders of Quality Machinery for Paper Mills

MANUFACTURERS AND DISTRIBUTORS IN CANADA: WATEROUS LTD., BRANTFORD, ONT.

sizing



Maximum sizing and pH control call for careful selection of the chemicals used in paper making. Their quality must be uniform, their purity consistent, in order to insure perfect sizing. To take the guesswork out of their selection of Aluminum Sulfate and other paper-making chemicals, leading producers throughout the nation—

SPECIFY "GENERAL CHEMICAL"

ALUMINUM SULFATE

Standard—Ground, 99% thru 8 mesh, 95% thru 10 mesh; Powdered, 95% thru 100 mesh; and Lump.

Iron Free—Ground, thru 8 mesh; Lump, approximately 2½".

SODIUM SILICATE

Solutions: From 38° to 60° Baume — Wt. Ratio (Na_2O to SiO_2) from 1:2.00-1:3.40

Appearance: Opalescent to clear.

GENERAL CHEMICAL PRODUCTS for the PAPER INDUSTRY

- Aluminum Sulfate *(Standard and Iron Free)*
- Muriatic Acid *(Hydrochloric)*
- Sodium Fluoride
- Sodium Silicate
- Sodium Metasilicate
- Glauber's Salt, *Crystal or Anhydrous*
- Salt Cake
- Sodium Sulfide
- Sodium Hyposulfite
- Sodium Sulfite, *Anhydrous*
- Sodium Bisulfite, *Anhydrous*
- Disodium Phosphate
- Trisodium Phosphate
- Tetrasodium Pyrophosphate
- Sulfuric Acid
- Nitre Cake *(Sodium Bisulfate)*
- Nitric Acid
- Chrome Alum
- Aqua Ammonia

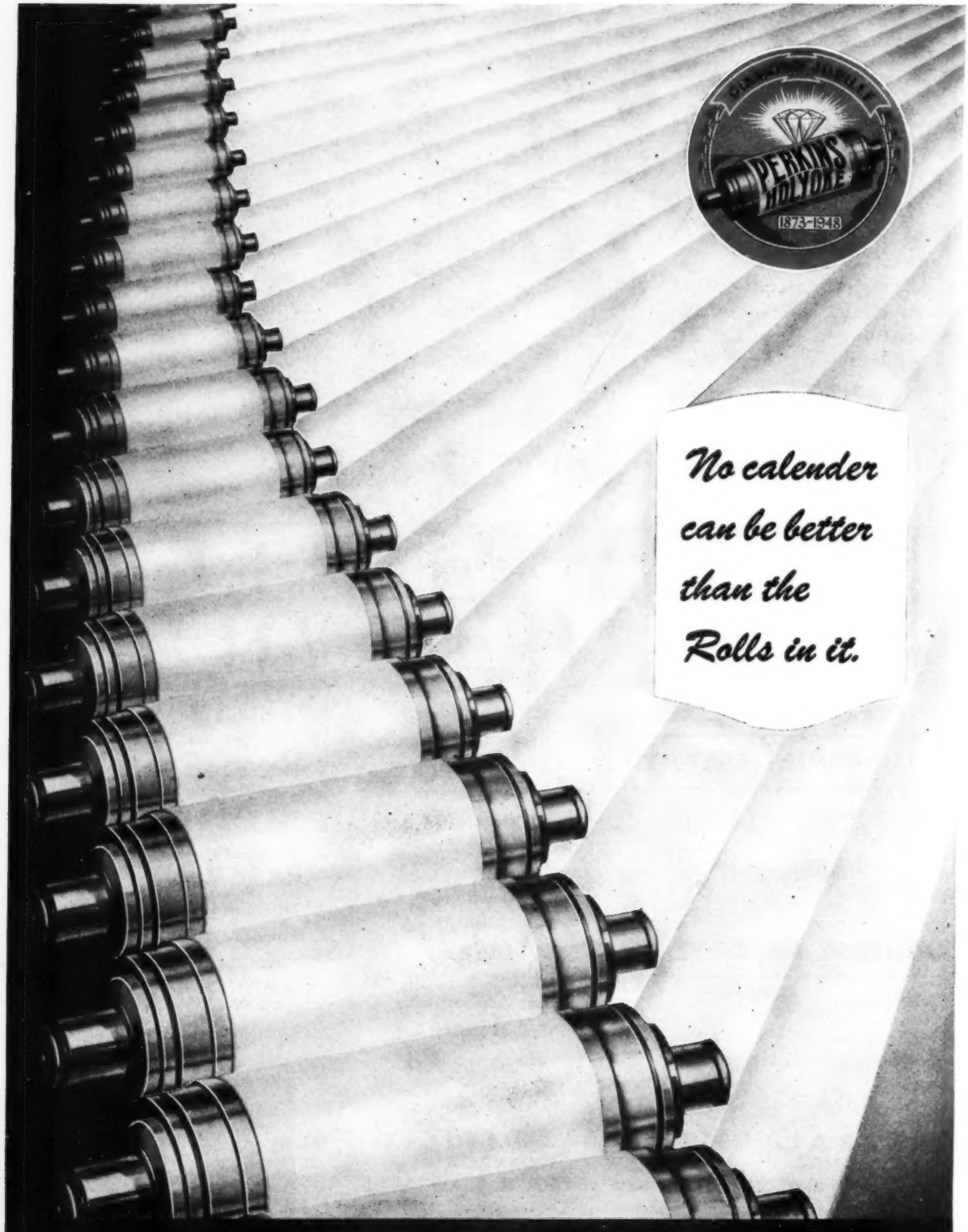
GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo Charlotte • Chicago • Cleveland • Denver • Detroit • Houston • Kansas City Los Angeles • Minneapolis • New York • Philadelphia • Pittsburgh • Portland (Ore.) Providence • San Francisco • Seattle • St. Louis • Wenatchee • Yakima (Wash.)

In Wisconsin: General Chemical Company, Inc., Milwaukee, Wis.

In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver

BASIC CHEMICALS
GC
FOR AMERICAN INDUSTRY



B. F. PERKINS & SON, Inc.

HOLYOKE, MASS., U.S.A.

LARGEST MANUFACTURERS OF CALENDER ROLLS IN THE WORLD

NEW stainless steel RECESSED-END fittings form low-cost, corrosion-resistant conveying lines by—

fast, simple SOLDERING BRAZING OR SOCKET WELDING...

TRI-CLOVER RECESSED-END fittings meet the demand for a complete line of low-cost stainless steel units which can be quickly assembled with lightweight tubing to form dependable corrosion-resistant liquid conveying lines. Available in sizes from 1" through 10" O. D., these high-strength fittings require no special installation technique... any one of three standard methods may be used—brazing, soldering or welding, to form permanent or semi-permanent lines. Check the features at the right and you will see why *RECESSED-END* fittings provide the answer to greater protection against corrosion and contamination, at lower installation and maintenance cost.

★ **A COMPLETE LINE**—Including Ells, Tees, Crosses, Return Bends, Reducers and Adapters.

★ **STREAMLINED DESIGN**—free flow, friction reduced to a minimum. Less space required. Completely porosity-free.

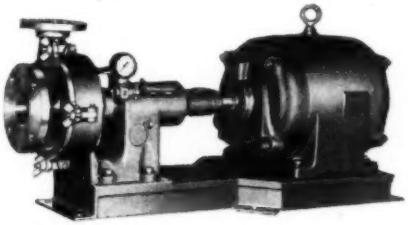
★ **FABRICATED IN 3 TYPES**—available in stainless steel type 304, 347 and 316, to meet wide corrosive conditions.

★ **SAVE UP TO 65% IN MATERIALS**—due to savings in "dead metal" as compared to heavier iron pipe size fittings, yet without loss of strength.

★ **AVAILABLE IN 2 FINISHES**—pickled or polished finish, with any combination of I. D. or O. D. finish required. All fittings fully annealed and passivated.

★ **READILY ADAPTABLE TO OTHER FITTINGS**—through the use of standard adapters, RECESSED-END fittings are easily adapted to virtually every other known type of fitting.

NOTE: TRI-CLOVER RECESSED-END fittings meet the quality requirements of A.S.T.M. specifications and Underwriters' Laboratories, Inc. standards for stainless steel fittings approved for the conveying of potable liquids.



TRI-CLOVER INDUSTRIAL PUMPS

Now available in a complete range of sizes and capacities up to 1250 GPM and up to 250 ft. head at Zero GPM. Highest quality corrosion-resistant construction. Fast, non-clogging centrifugal action with special seals for practically every requirement. Endorsed by users throughout chemical-process and allied industries. SEND FOR CATALOG 248.

● **RECESSED-END** *fittings are available from stocks of Tri-Clover Jobbers in all sections of the country. Call or write for descriptive* **CATALOG 948.**

Tri-Clover
MACHINE CO.
Kenosha, Wisconsin

TRIALLOY AND STAINLESS STEEL SANITARY FITTINGS, VALVES, PUMPS, TUBING, SPECIALTIES

FABRICATED STAINLESS STEEL INDUSTRIAL FITTINGS AND INDUSTRIAL PUMPS

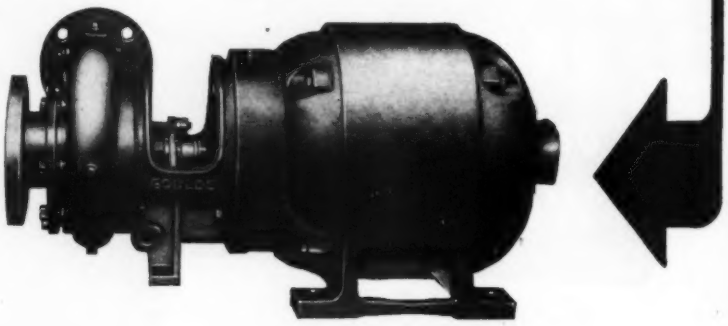
THE *Complete* LINE

NEW PUMP DESIGN
Moves more liquid... *at less cost*

YOUR PROBLEM: To move a liquid from one place to another place—and do it cheaply. Your cost is important. It includes initial cost, installation cost, and maintenance cost. And you don't want breakdown costs.

GOULDS ANSWER:

The New
"CLOSE-CUPLD"
Centrifugal



ABOUT INITIAL COST: The initial cost is about the same as other quality pumps.

ABOUT INSTALLATION COST: All you do is set this compact pump in place, connect it up and turn on the current. That greatly reduces installation cost.

ABOUT MAINTENANCE COST: The new design is aimed at maintenance cost. There are 5 features in particular that stand out: 1. Completely protected shaft, 2. Completely protected motor bearing, 3. Shaft sleeve free to expand or contract without buckling, 4. For flexibility the machined stuffing box is designed for either mechanical seal or die formed, semi-metallic packing, 5. Split gland for fast stuffing box repacking.

ABOUT BREAKDOWN COST: The new "Close-Cupld" has proved itself outstandingly reliable in the toughest tests we could devise.

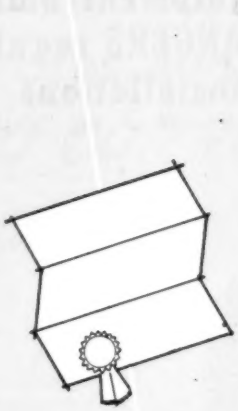
ABOUT YOUR PARTICULAR PROBLEM: Goulds "Close-Cupld" comes in 17 sizes . . . capacities to 2000 G.P.M., heads to 400 ft., depending on capacity. You can get "Close-Cupld" bronze fitted, all iron, or all bronze. You get prompt factory delivery, which means a "Close-Cupld" tailored to your particular job.

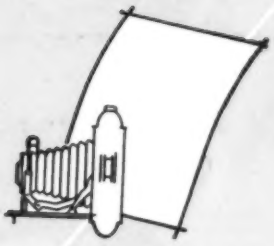
For one of these new pumps that moves more liquid at less cost, see your Goulds dealer or write to Goulds Pumps, Inc., Seneca Falls, N. Y.

GOULDS

PUMPS, INC.

the PUMP FOR the JOB





in

specialty papers

the trend is to

HERCULES staybelite size

In the manufacture of specialty papers, such as those for hot beverage cups, permanent manuscripts, and light-sensitive papers, more and more paper mills are benefiting from Staybelite* Size. Produced from Hercules hydrogenated rosin, Staybelite Size gives maximum brightness and permanency and a minimum of taste and odor to paper. This high-quality product is another example of Hercules applied research in the paper industry.

HERCULES

SIZING MATERIALS AND CHEMICALS FOR PAPER

HERCULES POWDER COMPANY

961 King Street, Wilmington 99, Delaware

*Reg. U. S. Pat. Off.

PPS-8

What influences major equipment builders to use ROSS "BCF" EXCHANGERS regularly for small to medium size installations

STANDARDIZED, COMPACT DESIGNS

LOW-COST, MASS PRODUCTION

CONTINUALLY CARRIED IN STOCK

Regardless of the make, there's one point on which most manufacturers of major equipment, their dealers and customers agree: *The Ross "BCF" unit is by far the most ideally suited for small to medium size oil or water cooling requirements.*

Primarily, they like the high heat transfer efficiency packed into this compact, standardized shell and tube design; the rugged yet lightweight construction; the permanent, leakproof, mechanically made tube joints; the straight, easily cleanable tubes; and the provisions for simple installation.

Secondly, but of equal importance, they like the low-cost, mass production . . . the constant availability from stock on 24 hours notice, if necessary.

No wonder then, that it's becoming a habit with buyers of major equipment to ask: "Is a Ross 'BCF' being furnished?" You'll ask the same question if you're familiar with all the features, and you *can* be by writing for *BULLETIN 4922* today!

ROSS

"BCF" EXCHANGERS

Ross Heater & Mfg. Co., Inc.

Division of American Radiator & Standard Sanitary Corporation

1430 WEST AVE. BUFFALO 13, N. Y.

Represented in Canada by Horton Steel Works, Ltd., Fort Erie, Ont.

MOST WIDELY USED OIL AND WATER COOLERS FOR DIESELS . . . GASOLINE ENGINES . . . TURBINES . . . REDUCTION GEARS . . . COMPRESSORS . . . HYDRAULIC PRESSES . . . THRUST BEARINGS . . . HYDRAULIC COUPLINGS . . . TORQUE CONVERTERS . . . INJECTION MOLDING AND DIE CASTING MACHINES

FOLDS, SQUARES AND TAPES OVER

150 CORRUGATED BOXES A MINUTE ON TIMKEN® BEARINGS

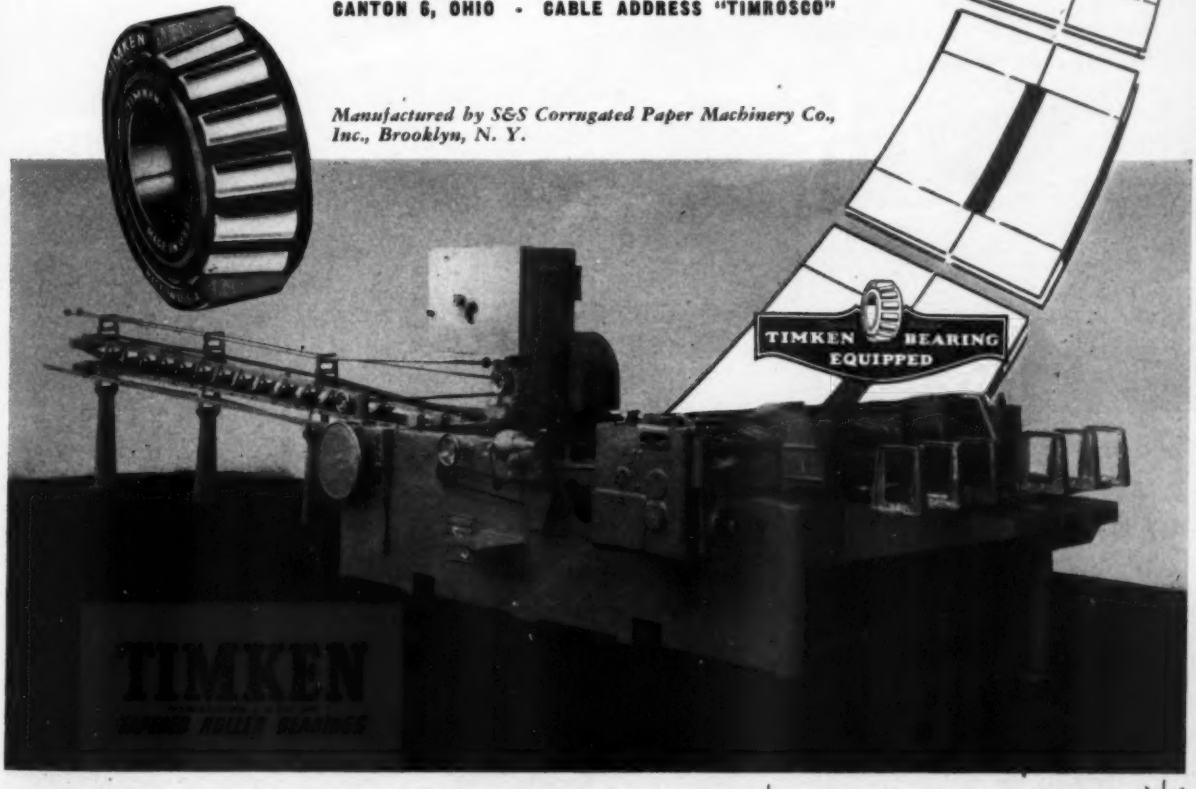
Savings in box production of more than $100 per day have been recorded through the use of the S&S Automatic Folding, Squaring and Taping Machine which, while a comparatively — and radically — new piece of equipment has been in everyday service long enough to prove its advantages and economies.

To help give this machine its fast, accurate, dependable performance, the manufacturer uses a total of 18 Timken bearings at the following positions; rear conveyor idler sprocket (2); kicker crank stud (2); cam gear box (2); rear gear box (2); folder gear boxes (8); delivery pulley shaft (2).

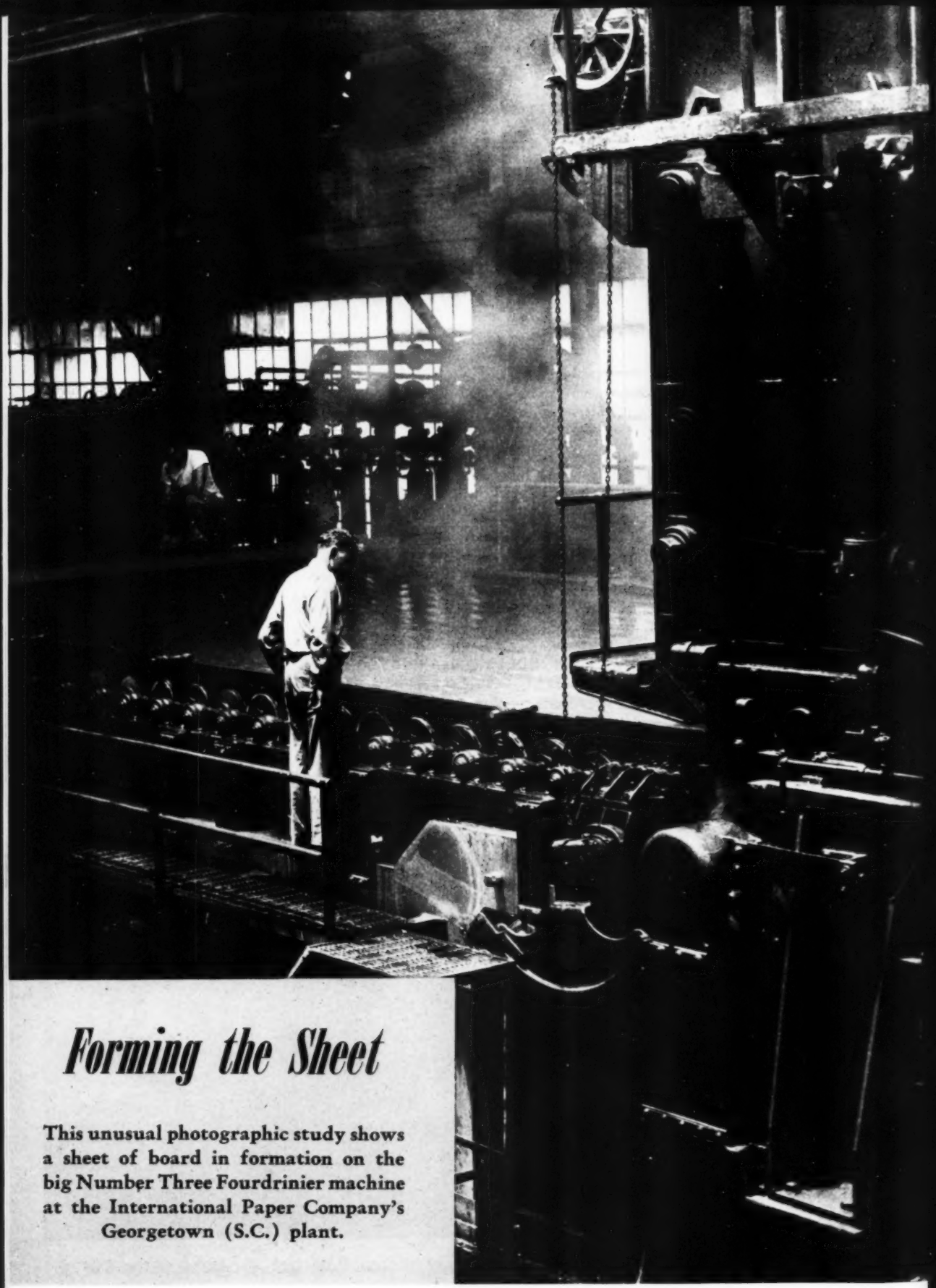
Wherever there is friction to be eliminated; radial, thrust and combined loads to be carried; shafts and gears to be held in constant alignment, specify "Timken Bearing Equipped". Look for the trade-mark "TIMKEN" on every bearing you use.

THE TIMKEN ROLLER BEARING COMPANY
CANTON 6, OHIO · CABLE ADDRESS "TIMROSCO"

Manufactured by S&S Corrugated Paper Machinery Co., Inc., Brooklyn, N. Y.



NOT JUST A BALL ◯ NOT JUST A ROLLER ▭ THE TIMKEN TAPERED ROLLER ▭ BEARING TAKES RADIAL AND THRUST → ← LOADS OR ANY COMBINATION



Forming the Sheet

This unusual photographic study shows a sheet of board in formation on the big Number Three Fourdrinier machine at the International Paper Company's Georgetown (S.C.) plant.

TRADE WINDS

International Paper Co. Marks 50th Year With Mill Celebrations

▶▶▶ IN OBSERVANCE OF the company's fiftieth anniversary in the pulp and paper industry, the thirty-one mills and plants of the International Paper Company held what is believed to have been the biggest birthday party of its kind ever celebrated in this country.

This nation-wide celebration took place during the week of June 14-19. The governors of Louisiana and Arkansas, the Governor-Elect of Florida, and the Lieutenant Governor of Mississippi, together with other civic, business and religious leaders of communities extending from the Gulf of Mexico, north to Maine and west to California, joined in the Golden Jubilee. These parties were mostly in the form of community-wide open house celebrations held simultaneously in various mill and plant communities of the Company—20 mills and plants, including eight mills and six converting plants in the South, and six mills in the North. Eleven other plants of the Company in the Northeast, Midwest, and far West held special parties for employees and special guests during the week.

At the same time, the six pulp and paper mills and four affiliated organizations of Canadian International Paper Company, a separate enterprise, held open house programs. These parties took place over an area extending from Montreal west to Gatineau, P.Q., northeast to the Bay of Chaleur and north to Lake Temiskaming.

Southern Mills Hold Open House

Eight mills and one converting plant located in six southern states comprise the Southern Kraft Division of the Company, headed by Major J. H. Friend, general manager of the Division and a vice president of the Company. Community-wide open house programs were held at each of these mills, the converting plants at each site joining with the mills. The Company has five other converting plants in the South.

The ceremonies at Bastrop (La.), where the Bastrop and Louisiana mills joined with the Multiwall Bag Plant and the Milk Container Plant, were honored by the presence of Governor

Special paper exhibit showing products and end-products made by International Paper Company and its customers. This exhibit was displayed by company mills as part of their open house programs

Long and his entourage. The Governor's party headed a special program for civic and business leaders of the state and community who made the initial tour of the Company's four Bastrop installations.

At Camden, Arkansas, Governor Ben T. Laney of Arkansas presided at the joint celebration of the Camden mill and the Multiwall Bag Plant.

Headlining the opening program on June 14 at Panama City, Florida, was Governor-Elect Fuller Warren of Florida.

Lieutenant Governor Sam Lumpkin of Mississippi presided at the open house program at the Moss Point (Miss.) mill.

At Springhill (La.), site of the Springhill mill and container plant, Dr. Stoke, president of Louisiana State University, presided amid a group of state and community civic and business leaders.

Mayor Sylvan Rosen, of Georgetown (S.C.), officiated at the opening ceremonies at the Georgetown mill program.

Varied Programs at Six Northern Mills

Open House celebrations in the Company's northern mills were highlighted by Employees' Field Days. These events provided a wide variety of entertainment such as picnics, dinners and open house parties. Medallion awards were presented by mill and plant officials to employees who have been with the Company for 25 years or more. The six northern mills which held anniversary celebrations were: The Hudson River Mill, at Corinth, New York; the Ticonderoga Mill, Ticonderoga, New York; the Niagara Mill, Niagara Falls, New York; the Tonawanda Mill, North Tonawanda, New York; the York Haven Mill, York Haven, Pennsylvania; and the Otis Mill, Livermore Falls, Maine.

Plants in the Midwest and far West which held special parties for employees and invited guests included: International Envelope Corporation, Dayton, Ohio; container plants in Chicago; Kansas City, Kansas; and St. Louis, Missouri; and the milk container plant in Kalamazoo, Michigan.

A main feature of all the community open house programs was a special paper exhibit showing the products and end-products made by the International Paper family and its customers. This exhibit, measuring 53 ft. long and 18 ft. at its topmost peak, is separated into three sections, showing the products made by the southern mills and plants, northern mills, and the mills and plants of Canadian International Paper Company.

Business Biographies

▶▶▶ RICHARD J. CULLEN has been chairman of the Corporation of International Paper Company since 1943.

From the outset of his career, Mr. Cullen has been associated with the paper industry, and possibly has done more than any other man to further its development in the South. Mr. Cullen was one of the first to open up the vast resources of southern woodlands as the raw material for making kraft paper. Later, Mr. Cullen again pushed back the technological frontier in the South by recognizing the commercial possibilities of mass-producing kraft container board on fourdrinier machines. For the last thirty years he has been one of the major figures responsible for the development of an industry which has been of incalculable value to the social and economic well-being of the South.

Richard J. Cullen
Chairman of the Corporation

As a young mechanical engineer, Mr. Cullen was employed in the Engineering Department of the Riordon Paper Mills, Limited, the properties of which are now part of Canadian International Paper Company.

His first assignment was in connection with the reconstruction of the Riordon pulp mill at Merritton, Ontario, near Niagara Falls, and he later designed and supervised the construction of the Riordon mill at Hawkesbury, Ontario. In 1909, he came to the United States as manager of the Cushnoc Paper Company in Augusta, Maine.

Some years later, Mr. Cullen became interested in the possibility of manufacturing kraft pulp and paper in the Southern states. The first kraft paper mill in the South had been built at Orange, Texas, in 1910, but the important development in kraft paper did not come until the 1920's.

In 1918, Mr. Cullen became vice president and general manager of the Louisiana Fibreboard Company of Bogalusa. He remodeled the mill which was later sold to the Great Southern Lumber Company.

He designed the plant of the Century Roofing Company of New Orleans, and later negotiated a consolidation of this company with the Richardson Paper Company of Lockland, Ohio.

In 1920, Mr. Cullen designed and built the Bastrop Pulp and Paper Company mill at Bastrop, Louisiana, for the manufacture of kraft pulp and paper. As soon as this mill began operating, he designed and built the Louisiana Pulp and Paper Company mill, also in Bastrop.

Bastrop and Louisiana mills operated independently until 1925, when International Paper Company purchased the Bastrop mill. Two years later International acquired the Louisiana Pulp and Paper Company mill, and at that time Mr. Cullen joined the International family as President of Southern International Paper Company. Later he became president of its successor, Southern Kraft Corporation. He was elected vice president of International Paper in 1927 and continued in direct charge of Southern Kraft operations until 1935, when he was appointed manager of manufacture of all International Paper Company's mills.

In 1927, under Mr. Cullen's direction, the Company began construction of the mill at Camden, Arkansas, the first Southern Kraft Mill built by International, which was completed early in 1928. Also, in 1928, the Moss Point, Mississippi, mill, originally constructed in 1912, was acquired and remodeled by the Company. In 1929, under Mr. Cullen's supervision, the Company built the Mobile, Alabama, mill which began production of various grades of kraft paper the same year.

During the late 1920's Mr. Cullen had become interested in the vast possibilities of mass-producing an all-kraft board for shipping containers on fourdrinier paper machines. Board of this type had been produced experimentally and to a limited extent commercially during the 1920's, but large-scale commercial production began in March,

PAPER · · · America's 6th Industry

CENTENNIAL SPOTLIGHT 1848-1948
In this 100th anniversary year of Machine Builders for the Paper Industry, Puseyjones points with pride to outstanding post-war installations. In the spotlight . . . 132" Fourdrinier Machine with 12 ft. diameter M. G. Yankee Dryer for San Rafael Paper Co., Mexico.

PAPER BAGS FOR "HYBRID" CORN

(NEWS ITEM: *A new method of corn culture uses paper bags to control the breeding of each corn plant.*)

There's a revolution in the corn belt . . . controlled breeding which results in "hybrid" corn is replacing the old method of corn culture. And one of the first steps depends on a paper bag! As soon as tassels begin to appear, a waterproof kraft paper bag sealed with waterproof glue is tied about the tassel of each plant to collect the pollen which will fertilize a strain of corn that will be identical from season to season. The height and yield of each cornstalk can thus be controlled, resulting in additional cash income and less labor for today's farmer.

Paper bags to package ice . . . paper cans for frozen foods . . . paper tape for recording sound . . . new uses for paper calling for new standards of lightness and toughness, new standards of quality in performance. New responsibilities — new opportunities for the Pulp and Paper Industry.

The Puseyjones Organization is now devoting itself completely to the design and construction of Paper-Making Machinery built to new high standards of speed and efficiency, and to the modernization of existing machines. Additional capacity in Metals Fabrication is now available through conversion of facilities formerly devoted to the building of ships.

Puseyjones Engineers will welcome the opportunity to work with you in solving production problems.

THE PUSEY AND JONES CORPORATION
Established 1848. Builders of Paper-Making Machinery
Wilmington 99, Delaware, U. S. A.

THE SIGN OF TRADE MARK SUPERIOR QUALITY

1931, when International's Panama City, Florida, mill, built during 1929 and 1930, started operations. The Panama City mill, designed by Mr. Cullen, was the first kraft mill to be devoted exclusively to container board production. Its present capacity is 900 tons per day.

In 1937 the Company built another large container board mill at Georgetown, South Carolina. In 1942 it was enlarged to become the largest paper mill in the world, with a capacity of 1,350 tons of board per day. In 1938, the Company completed construction of the Springhill, Louisiana, mill which, with subsequent additions, has a daily capactiy of 780 tons of kraft container board and 230 tons of fine grades of bleached kraft paper and board.

Mr. Cullen became a director of International Paper Company in January, 1936, and a few weeks later was elected president of the Company. In 1943 he was elected chairman of the corporation and was succeeded as President by Mr. John H. Hinman.

▶▶▶ JOHN H. HINMAN has been president of International Paper Company since 1943, when he succeeded Richard J. Cullen who at that time became chairman of the corporation.

Born at North Stratford, N. H., October 2, 1885, Mr. Hinman was graduated from Dartmouth College in 1908. Five years later he became associated with International Paper Company when he was employed as Woods Manager of American Realty Company, a subsidiary of International.

Mr. Hinman brought with him into the pulp and paper industry an inherent love of the woodlands. This deep and abiding interest in conservation of forest reserves and full utilization of the woodlands has been a distinguishing characteristic of his career in the industry.

John H. Hinman, President

In 1927 he was appointed general woods manager in charge of all the Company's timberland and woods operations, and the following year was elected a vice president of the Company.

In May of 1935 he became vice president of Canadian International Paper Company, and in January of 1938, he was elected president. During this period, from 1935 to 1939, he made his home in Montreal.

In 1939, Mr. Hinman left Montreal and returned to New York. Four years later he succeeded Mr. Cullen as president.

Mr. Hinman's basic business philosophy is contained in the statement he made on January 31 of this year, at a Company dinner for employees of the New York office in celebration of the actual 50th anniversary date of the establishment of the Company on January 31, 1898. At that time he said:

"It has become increasingly evident that the future of International Paper companies does not lie in any narrow conception of the uses of wood, but in a full realization that we are harvesters of a crop from which we, alone or with others, can develop a great variety of products for the good of man. Perhaps in the next half century we will discover that paper was only the first of many such products."

Mr. Hinman is a strong believer in the theory that present security and future growth of the U. S. pulp and paper industry depend upon the widespread adoption of scientific woodland management practices and that tree farming and the cultivation of trees as a crop can insure a perpetual supply of wood for all present and future purposes.

In keeping with this policy, International Paper Company both in the North and South, carries on an intensive program of woodland conservation and conducts laboratory research aimed to develop fuller utilization of forest resources.

▶▶▶ H. R. WEAVER, first vice president, International Paper Company, has held that position since May 12, 1943. He has been with the Company longer than any of the other officers.

Born in Utica, New York, October 25, 1888, Mr. Weaver was graduated from Cornell University in 1909 and was first employed by International Paper Company as an accountant on January 6, 1913.

Four years later, on May 1, 1917, he became Manager of Accounts. When International Paper and Power Company was formed in 1929 he was elected a vice president and the following year was made treasurer also, taking over the same positions in the present International Paper Company after its organization in 1941. On May 12, 1943 he was elected first vice president. He continued to serve as treasurer, also, until May 14, 1946. He has been a director since 1936.

Harrison R. Weaver
First Vice President

Important Dates in the History of International Paper Co.

1898

International Paper Company was incorporated on January 31, 1898, bringing together twenty pulp and paper mills in Maine, New Hampshire, Vermont, Massachusetts and New York. Total production that year was nearly 400,000 tons. More than 90 per cent of mill capacity was newsprint.

1913

Philip T. Dodge was elected president in January, 1913, and served until May, 1924.

1916

The member of the International Paper Company family, now known as Canadian International Paper Company, was incorporated in Quebec.

1917

Construction was begun on Canadian International's newsprint mill at Three Rivers, Quebec. This mill was to become the largest newsprint mill in the world.

1922

Three Rivers mill of Canadian International Paper Company began operations.

1923

The International Paper Company inaugurated its group insurance program.

1924

Archibald R. Graustein was elected president of the Company.

If you're interested in valves that will give you any or all of these operating advantages then you'll be interested in

NON-CONTAMINATING

MINIMUM MAINTENANCE

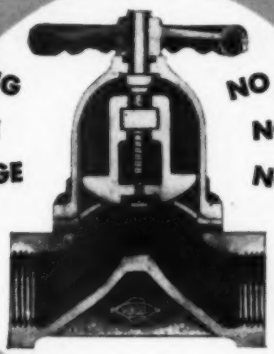
NO VALVE STEM LEAKAGE

NO CORROSION

NO CLOGGING

NO SEEPAGE

GRINNELL - SAUNDERS DIAPHRAGM VALVES



Valve Open

Valve Closed

FOR CHEMICALS

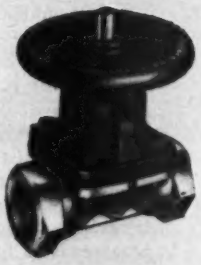
Stainless Steel valves with special diaphragms are handling satisfactorily such corrosive chemicals as phosphoric, acetic and chromic acids.

FOR BEVERAGES

Bronze valves with socket ends (left) and with hose threaded end (right), both with special white rubber diaphragms, are stopping leaks and cutting maintenance to the bone in breweries handling millions of barrels of beer.

FOR PULP and PAPER

Rubber lined valves are setting new performance records handling pulp, alum and sulphuric acids in paper mills.

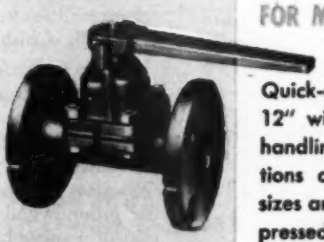


FOR TEXTILE PLANTS

Aluminum body valves with rising stems have won enthusiastic approval in bleacheries handling hydrogen peroxide and other chemicals.

FOR FOODS

Piston-operated valves (left) and air motor operated valves (right), both glass lined and with proper diaphragms, are providing remote control in plants handling sodium chloride, sodium hydroxide, sulphuric acid and fruit juices.



FOR MINES

Quick-operating valves up to 12" with rubber lining are handling highly abrasive solutions and slurries. Smaller sizes are widely used on compressed air lines to prevent leakage.

Grinnell-Saunders Diaphragm Valves may eliminate valve troubles and cut valve maintenance on your pipe lines. Available in any combination of valve bodies and linings, diaphragms and operating mechanisms. State your requirements or ask for Catalog 6-E on "Grinnell-Saunders Diaphragm Valves". Grinnell Company, Inc., Providence 1, R. I. Branch warehouses in principal cities.

GRINNELL

WHENEVER PIPING IS INVOLVED

1925

The Bastrop mill, built by Richard J. Cullen, was purchased, marking the entry of International Paper into the great Southern Kraft field.

Canadian International acquired, through the Riordon Purchase, the Kipawa and Hawkesbury mills in Canada, mill sites, water power sites, and some 10,000 square miles of timber limits. Kipawa was the first mill designed and equipped for the exclusive manufacture of dissolving woodpulp.

Also acquired in connection with this same purchase was the Ticonderoga mill in New York.

Canadian International began construction of the Gatineau newsprint mill.

1927

International Paper acquired the Louisiana mill at Bastrop, built by Richard J. Cullen, and brought Mr. Cullen into the Company.

Gatineau newsprint mill of Canadian International Paper Company began operations.

International acquired control of a company manufacturing multiwall shipping sacks.

1928

The Camden, Arkansas, mill was built. This was the first Southern Kraft mill constructed by International.

The Moss Point, Mississippi, mill, built in 1912, was acquired.

1929

Mobile, Alabama, kraft paper mill began operation.

International Envelope Corporation, a subsidiary, acquired a plant in Dayton, Ohio, which manufactures stamped envelopes for the U.S. Post Office.

1930

Newsprint mill at Dalhousie, New Brunswick, owned by New Brunswick International Paper Company, began operation.

1931

International bought the Tonawanda mill, in North Tonawanda, New York—newest mill of the company in the U.S. North.

The same year the Panama City, Florida, mill began producing kraft container board on a modern mass-production basis for the first time, opening up a big new market for the Company.

1934

The Moss point mill was rebuilt to produce bleached kraft wrapping and specialty papers.

1936

Richard J. Cullen became president of the Company.

1937

Two container board machines completed at the Georgetown, South Carolina, mill.

1938

The Springhill, Louisiana, mill was completed.

1940

International entered the shipping container field on a large scale, acquiring company with plants at Whippany, N.J.; Somerville, Mass.; Chicago, Ill.; and Kansas City, Kans.

1942

The famous No. 3 machine was installed at the Georgetown mill, bringing the daily capacity up to 1,350 tons of container board and making Georgetown the largest single paper mill in the world. Georgetown shipping container plant completed.

1943

Mr. Cullen was elected chairman of the corporation and was succeeded as president by John H. Hinman.

1945

The Company inaugurated its retirement plan for employees.

1946

Canadian International set up a retirement plan for its employees.

Single Service Containers, Inc., manufacturer of paper milk containers, was acquired by the Company.

The Container Plant at Springhill, La., delayed by the war, was virtually completed.

Shipping container plant at St. Louis, Mo., acquired.

1947

Shipping container plant at Los Angeles, California, acquired.

International announces postwar construction program involving expenditure of $47,000,000 during years 1947, 1948 and 1949 and including increases in kraft board capacity of about 900 tons daily and kraft paper capacity of about 375 tons daily.

In this, the Company's 50th year, production reached a new high—2,983,132 tons of paper, container board and pulp. The Company paid off the final balance of its term bank loan, leaving it free of funded debt for the first time in its history.

1948

The Company rounded out its first fifty years on January 31.

I. P. Company's $46,000,000 Program of Modernization Is Outlined

▶▶▶ THE FIRST DETAILS of the International Paper Company's $46,000,000 expansion and modernization program were given out June 12 on the eve of the Company's 50th anniversary celebration. This announcement was made jointly by John H. Hinman, president, and J. H. Friend, vice president in charge of the Southern Kraft Division, with headquarters in Mobile.

This great postwar program began last year, will continue through 1948 and on into 1949, and will improve the company's mills and plants in eleven southern and three northeastern states.

A summary of the major improvements at each mill as covered by this program is as follows:

Otis Mills, Chisholm, Maine

A new water-filtration plant is being completed to remove dirt and organic matter from the water of the Androscoggin River. The object of the improvement is to obtain cleaner pulp. Otis also has gained from additions to the groundwood bleach plant, installation of a waste-burning boiler, making for a fuller use of forest products, the addition of equipment for the production of supercalendered papers and many changes to the papermaking machines and auxiliary equipment, to increase efficiency, and to improve the quality of the paper.

Hudson River Mill, Palmer, N. Y.

The highlight of the expansion at this mill was equipping one papermaking machine to coat paper in a continuous operation. The process involved adding a stage to the fourdrinier machine to coat both sides of the paper with a clay solution after it is dried but before it is calendered and supercalendered. A new finishing room building complete with finishing equipment has just been installed. By the end of the year, virtually all of the sulphite pulp manufactured at Hudson River will be bleached because of the completion of a large addition to the bleach plant. The plant making Bindarene, an industrial by-product of papermaking, will be improved with new dryers and related equipment.

Niagara Falls Mill, Niagara Falls, N.Y.

Virtually all departments of the Niagara Falls mill will benefit from the capital expenditure program. One of the major jobs is the installation of a new pulp storage building which will increase the inside storage capacity of the mill by 6,000 tons of baled and lapped pulp. The building will be equipped with overhead cranes and conveyors which, with equipment changes such as the installation of several hydrapulpers, will thoroughly modernize the handling of pulp and other raw materials. A new high pressure boiler having a capacity of 60,000 lb. of steam per hour is being installed. Improved methods of manufacturing pulp from waste magazine papers by more efficient disintegration, de-inking, washing, and bleaching are being adopted. New pulp refining equipment, together with major changes to the "wet" or fourdrinier

THE most practical solution to mounting manufacturing costs lies in machinery that can set new standards of speed and economy. Have you considered the fact that this applies to grinding as well as to other machining operations? If not, you owe it to yourself to take stock of the grinding equipment in your plant. If it's obsolete, chances are it's bottlenecking your production. It will pay you to invest in new equipment, designed from the ground up to make your production more profitable. To help you do this, Bridgeport makes a complete line of grinding machinery for nearly every grinding, buffing and cut-off requirement, ranging from the sharpening of paper-cutting knives to snagging heavy castings. Bridgeport machines are built big to permit heavy feeds on hardest stock, and to produce a smooth, accurate finish that frequently eliminates second operation work.

In some plants Bridgeport Grinders are setting new cost-cutting records; in others, they are pointing the way to completely new methods of metal removal. Whatever your grinding problem, Bridgeport equipment engineers and abrasive specialists are ready to give you the best machine and the best abrasive wheel for every job.

BRIDGEPORT SAFETY EMERY WHEEL CO.
1306 West Broad Street, Stratford, Connecticut

Just off the press . . . Bulletin 2700 on Bridgeport Heavy Duty Face and Knife Grinders. Write for it today.

Bridgeport
GRINDERS

Horizontal Face Grinders, Vertical Grinders, Cutlery Grinders, Buffing Lathes, Knife Grinders, Floor Stand Grinders, Abrasive Cut-off Machines, BuXite Abrasive Wheels.

end of the paper machines, round out the improvement program.

Ticonderoga (N.Y.) Mill

A new six-ton digester will bring Ticonderoga into better balance, so that it will have to bring in less of the pulp it needs to make its many paper specialties. At the same time the liquor-making equipment and buildings are being enlarged to take care of the additional pulp capacity. Three new high pressure boilers are being installed each having a capacity of 60,000 pounds of steam per hour, which with the new recovery boiler recently put into service and with a new 4,000-kilowatt steam turbine, will completely modernize Ticonderoga's steam and power plants. A Cottrell electronic precipitator is being installed in conjunction with the new recovery boiler. This equipment will remove 90 per cent of the dust particles which now escape up the stack. Vacuum save-alls are being installed which will produce a virtually "closed" white water system which will result in a considerable saving in fiber and clay. A number of changes and improvements in the beater room and on the paper machines is being completed.

York Haven (Pa.) Mill

Modern high efficiency beaters and refiners have been installed. New paper machine screens, drives, and pulp-cleaning, and handling equipment have resulted in increased flexibility, improved quality, and increased production. A large amount of regular maintenance work deferred because of the war and scarcities will be completed this year.

Tonawanda Mill, No. Tonawanda, N.Y.

A major improvement of the earlier postwar program was the installation of a modern high pressure recovery boiler with a capacity for handling the liquor from 100 tons of pulp. This replaced three rotary incinerators which had a combined capacity of about 80 tons daily. This installation recovers more efficiently the heat generated when burning the combustibles in the liquor. Former equipment recovered only one-third of the heat now recovered.

A modern high pressure, spreader-type, stoker boiler has also been added to the main boiler house.

New quintuple-effect vacuum evaporators have been installed in the pulp mill and are used in conjunction with the new recovery boiler.

Modern beaters, paper machine screens, and pulp-handling equipment have been added.

A new drive on the paper machines will improve speed and efficiency and allow more flexibility. New bleaching and washing equipment will increase the capacity of the pulp mill and improve quality. A new multiple-knife chipper was put into service which, in conjunction with a new Diesel crane in the wood yard, increases the mill's wood handling and wood preparing capacity. A Cottrell precipitator similar to the one being installed at Ticonderoga is nearing completion.

▶▶▶ IN THE SOUTH all areas where the Company has mills will derive benefits from the expansion program which will increase the productive capacity of the Southern Kraft Division by 200,000 tons per year. Following is a summary of the major improvements to be made at each southern mill:

Bastrop and Louisiana Mills

Increased pulp and machine capacity at the Bastrop mill (which is devoted wholly to the manufacture of Chemfibre) will raise potential output from 270 tons per day as of the first of the year to about 330 tons a day by the end of 1948. At the Louisiana Mill (also in Bastrop) which makes kraft paper and kraft specialties, the improvements call for additional pulp mill capacity, a continuous caustic system, a new fourdrinier paper machine, additions to the present machine capacity, and increases in both the power plant and the bleach plant.

Georgetown (S.C.) Mill

At the Georgetown mill, which underwent a large expansion program in 1942, making it the largest single paper mill in the world, the new expansion plans call for still more machine capacity. The production of Chemfibre and kraft container board is currently rated at about 1,350 tons a day, and the expansion program will result in an increase in Chemfibre production of 20 tons and kraft board production of 30 tons a day by the end of 1948.

Panama City (Florida)

The modernization program at Panama City involves additional pulp mill and machine capacity and additions to the power plant. Kraft board production, in which Panama City has specialized since the mill was opened in March, 1931, is currently rated at 800 tons per day and by December 31, 1948 will have risen to 1,000 tons daily.

Camden (Ark.) Mill

The expansion program at the Camden mill, devoted to the manufacture of kraft paper, involves additional pulp mill capacity, increased paper machine capacity, and a new power plant. The capacity was rated at over 330 tons a day as of the first of the year, to which 115 tons a day will be added by the year end.

Springhill (La.) Mill

The Springhill mill will be expanded, with additional kraft pulp and bleached pulp capacity, and increased machine capacity which will become available in 1949. The bleach plant will also be enlarged to enable it to handle the additional requirements of the mill, and the power plant equipment will be substantially increased.

Moss Point (Miss.)

At the Moss Point mill only minor improvements are being made. Installation of a continuous caustic system will increase the rated capacity somewhat. By the year end the mill's daily capacity for kraft paper specialties will approximate 230 tons daily.

Mobile Mill and Bag Plant

The expansion program at the Mobile mill and plant involves a new continuous caustic system and additional power plant equipment. The capacity of the mill is being somewhat increased and by the year end should reach a total of better than 500 tons of kraft wrapping and bag paper a day. The bag plant converts the bulk of this paper into millions of paper bags including ordinary brown grocery bags and a wide variety of specialty bags.

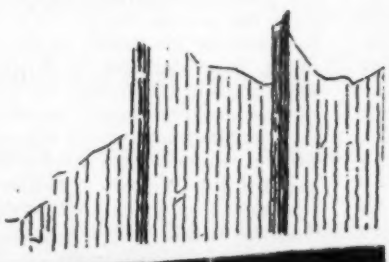
▼

RAILROAD TESTS DIESEL UNITS FOR DELIVERY OF CANADIAN NEWSPRINT

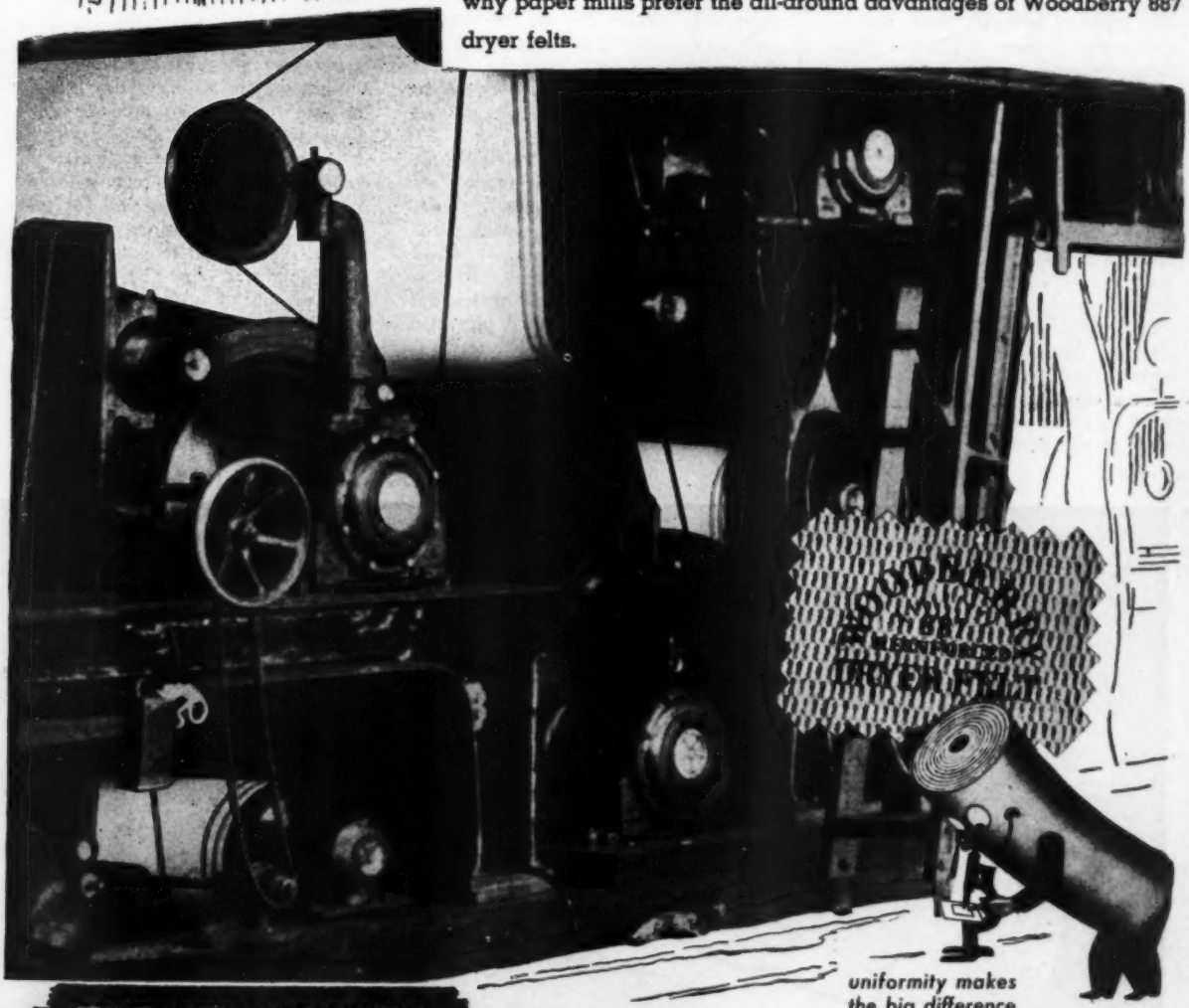
A series of tests that may result in faster delivery of newsprint from Canada was started April 7 in Utica, New York, by an 83-car New York Central freight train powered by three 1500-horsepower Diesel units.

Railroad executives said the tests will determine the effectiveness of Diesel units pulling a heavy load over mountain grades. The railroad, starting with a load of 2600 tons, plans to add 100 tons each day as the test train makes a daily round-trip run through the Adirondacks between Utica and Malone, about 150 miles to the north. Newsprint usually is brought from Malone to Utica via Watertown and Rome, thus avoiding steep mountain grades.

Savings are Higher With This Better Dryer Felt



There are extra savings for you in Woodberry 887's patented feature—asbestos yarns woven at scientifically determined intervals into the face of these heavy duty dryer felts. Add this to the extra savings in the lowered steam consumption that results from Woodberry's high degree of porosity—check the finer qualities of paper you get with Woodberry's highly uniform contact surfaces—and see why paper mills prefer the all-around advantages of Woodberry 887 dryer felts.



uniformity makes the big difference

TURNER HALSEY
COMPANY
Selling Agents
40 WORTH ST. • NEW YORK

Mt. Vernon-Woodberry Mills

Branch Offices: CHICAGO • ATLANTA • BALTIMORE • BOSTON • LOS ANGELES • AKRON

UNIQUE ENGINEERING AID USED BY HOBERG TO PLAN BLEACHERY

A unique engineering aid was employed by Hoberg Paper Mills, Inc., Green Bay, Wisconsin, last month when preparations were made for the addition of a new hypochlorite type continuous bleachery in its sulphite mill. Supplementing the preliminary drawings by the company's engineering department, it obtained a scale model of that section of the building in which the structure was to be located. Tiny reproductions of machinery and equipment, even to miniature motors, piping and equipment, were exact in almost every detail.

It was necessary for the Hoberg company to remodel a section of the plant to permit the new installation. The model included these building changes. A new IMPCO washer-thickener was to be installed. The model included this equipment. Nearly everything in the building was represented in the model, even to the hand rail on the stairway.

Entirely demountable, the miniature building was constructed to permit moving sections or pieces of equipment to various locations. Engineering department officials and management held conferences using the model as a visual aid in understanding technical details. Then before final plans were drawn they decided to relocate some of the equipment. The model, being built to exact scale, allowed them to shift certain pieces to another location with the assurance that there was sufficient room or that there would be no interference with piping and other installations.

The Hoberg company expects to start actual building of the bleachery sometime this month. The new addition should be in operation in November. Cost of the project is estimated at $115,000. New equipment will consist principally of the IMPCO eight foot by fourteen foot vacuum washer-thickener and a double shaft mixer. Stock will be bleached in a thirty-eight foot high, fourteen foot diameter, tile-lined concrete tower.

The company is also contemplating the construction of a new research laboratory. Again they are making use of a scale model as an engineering aid. Complete in minute detail, it includes everything from sinks and ovens to intricate tensile testing machines and balance scales.

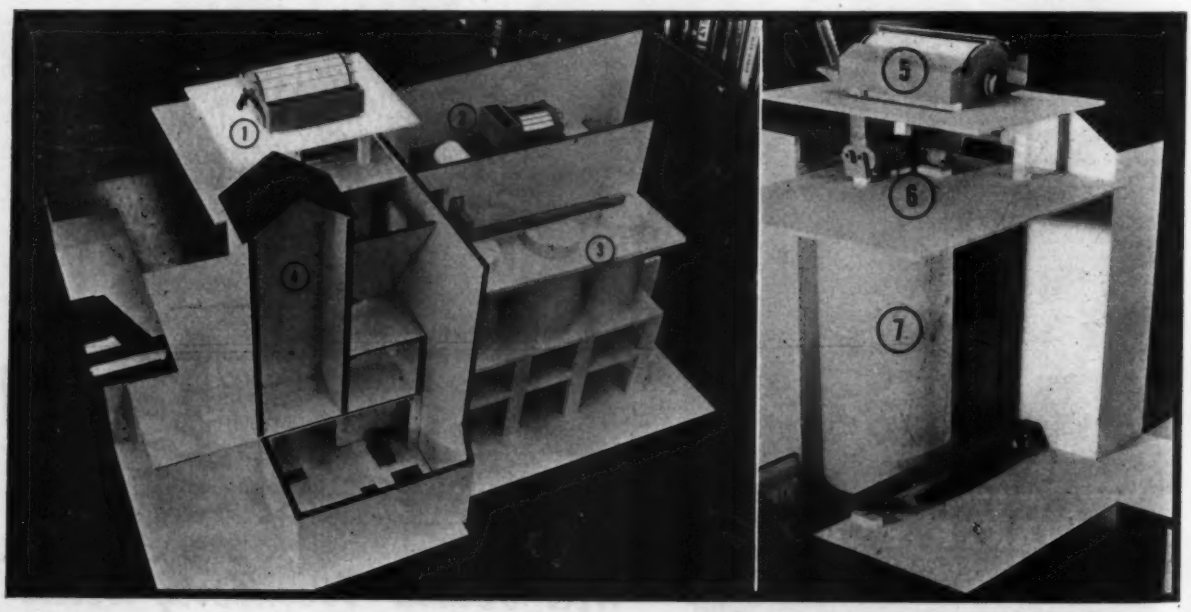
Built by the Roycraft Models Works of Green Bay, these scale models are becoming more and more popular in the Wisconsin area. When the Ansul Chemical Company at Marinette planned its new building, now being erected, a Roycraft model was the basis for construction. A plot plan scaled one inch to twenty-five feet was built for the Green Bay Box Company's new paper mill, along with models of each building scaled one quarter inch to the foot.

An entire business district being built by Nekoosa-Edwards in the little paper mill village of Port Edwards, Wisconsin, was first constructed in miniature by Roycraft Models. (See illustrated story in this section.)

Five people work in the Roycraft Models studio, each skilled in woodworking and specializing in some phase of the work. Roy Winters, owner, settled in Green Bay shortly after the war, moving there from Chicago. He chose the location because he foresaw an outlet for his models in the heart of the paper industry of Wisconsin. Paper mills by their nature being complicated structures, usually require elaborate engineering drawings when additions expansion or new construction is planned. It is Winters' contention that his models eliminate such elaborate drawings, and in most cases cost much less.

"They are a short cut to plant layout and the installation of new equipment," he said. "They make it possible to show an accurate third-dimensional reproduction of a proposal that can be understood particularly by those not familiar with technical drawings. They can be retained for years as (1) an entire property plot plan, (2) as plant layout including interiors and equipment, and (3) as architectural models of proposed plant additions and expansion."

Lighting and even interior decorating are included in a complete model when required. A landscape architect is on the staff to provide ideas and planning for those desiring it. Trees,



Model of building at left shows a cutaway section of sulphite mill at Hoberg Paper Mills, Green Bay, Wis., where new bleachery will be installed. At right is shown rear view. (1) New IMPCO washer-thickener; (2) the present Oliver and IMPCO; (3) present three bleach tanks; (4) chip elevator; (5) new washer-thickener; (6) mixer equipment; (7) new bleach tower. These unique models are designed by Roycraft Co., Green Bay

The ABC's of Casting Problems

A stands for Abrasion, which wears a casting until its effectiveness is gone. B stands for BTU's

(heat) which oxidizes castings, destroys their physical properties. C is for Corrosion

which eats away the casting until it fails in service.

These are problems that increase operating costs, cause shutdowns, and cut production. But there is an ABC answer — turn them over to *ESCO*.

For years *ESCO* engineers and metallurgists have fought abrasion, heat and corrosion in pulp mills, and chemical, cement and food processing plants all over the world. Problems of all kinds have been met, individually attacked and individually solved. In this way a great fund of experience and knowledge has been built. This enables *ESCO* not only to select the best alloy steel for a given purpose, but also to design and make the equipment itself, whether it be a small specialized fitting or a huge casting like the one shown at the right.

This experience often points the way to lower operating costs and increased production. It is available to you. Consult your nearest *ESCO* representative, or write us about your problem. No obligation, of course.

54-inch turbine runner cast of ESCO stainless steel. Casting weighs over 4,800 pounds.

Up-to-Date Information Available

Periodically *ESCO* issues bulletins on developments in stainless steel metallurgy. To receive this data, simply fill in and mail the coupon below.

ESCO ALLOY STEEL FOR ULTIMATE ECONOMY

ELECTRIC STEEL FOUNDRY

2151 N.W. 25th AVE., PORTLAND 10, OREGON

Chicago · Eugene · Honolulu · Los Angeles · New York · San Francisco · Seattle · Spokane · Vancouver, B. C.

ELECTRIC STEEL FOUNDRY
2151 N.W. 25th Avenue
Portland 10, Oregon

Please put me on your list to receive current and future ESCO bulletins.

Name_____

Address_____ Zone_____

City_____ State_____

shrubs, and the like are reproduced realistically. On occasion Winters takes portable equipment to the scene, where he builds the model "on location."

▼

AUSTRALIAN PAPER NEWS

Paper Makers Pty., Ltd.

It is announced that Paper Makers Pty., Ltd., a subsidiary of Associated Pulp and Paper Mills, Ltd., Burnie, Tasmania, intends to install a plant capable of providing 10,000 tons of hardboard a year. When in full production, the plant will make available for building purposes 2,500,000 square yards of cardboard per annum. Major plant units are on order and some are already awaiting shipment.

Paper Companies' Merger

Plan for merging Cumberland Paper Board Mills Ltd., of Sydney and Australasian Paper and Pulp Company, Ltd., of Melbourne, is being prepared by the directors of the two companies.

Basis is the acquistion by Australasian Paper of all the Cumberland Paper Board shares by an issue of its shares to Cumberland Paper shareholders, subject to Treasury approval.

Whole of the ordinary capital of Australian Paper Manufacturers, Ltd., one of the largest undertakings in Australia, is owned by the two companies.

The merger is considered necessary by the directors to simplify the structure of the organization, and, because of the operating company's large expansion plans, is in the interests of all three companies, the directors state.

Details are being worked out and are expected to be announced soon.

Australian Paper holds 77.6 per cent and Cumberland Paper 22.4 per cent of the operating company's capital of £2,200,000.

Old Australia Mill

In its "Australiana" column and over the initials C.E.C. (Vic.), the *World's News* in its issue of May 1, 1948, published the following: "Paper Pioneers. Readers and writers alike regret Australia's dependence on outside resources for newsprint; but the paper industry flourished for half a century in southern Victoria. In 1854, a Geelong venture failed for lack of capital, but in 1876 a successful company was formed with headquarters in Melbourne and a factory at Fyansford near Geelong. The company erected a massive blue-stone building, and water to drive the waterwheel was brought from the upper reaches of the Moorabool River via a race blasted through solid rock. In January, 1877, Loch Garry brought the machinery. Work commenced in December, 1877, with 200 workmen. Local waste, rags, rope ends, used paper and imported wood pulp furnished the raw material for over 40 types of paper, from fine writing to coarse cartridge. The mill closed in 1923, but the blue-stone building with its picturesque waterwheel bear mute testimony to a valuable industry that was allowed to lapse."

New Zealand Paper and Pulp Industry

An interesting statement on the development of the New Zealand pulp and paper industry has been made by Commissioner of State Forests Skinner. He says: "In contrast to the world timber supply position, the forward pulp and paper position recently investigated overseas by A. R. Entrican, the director of forestry, was not so encouraging as far as export markets were concerned. Unlike timber, pulp and paper carried no huge accumulated shortages, and what shortages did exist would probably be eliminated within three years.

"What is most significant is that North America has such a potential wealth of logging and sawmill waste available from its current operations that any increased production required will be much more cheaply obtained from there than from New Zealand resources.

"North America is expected in a few years to become independent of the enormous supplies of north European pulp which it previously imported, making a large supply of pulp available for all world markets, including Australia.

"New Zealand must therefore be most cautious when contemplating expanding pulp-producing facilities for any considerable export during this current period of extremely high capital investment."

Mr. Skinner explains that it was in view of the need for an independent investigation of such a nationally important project that the Government had obtained the services of the Rust Engineering Company of Pittsburgh, Pennsylvania. That firm had been very prominent for many years in designing and constructing pulp and paper mills in the Southern United States, where the use of pine pulpwood similar to the product from New Zealand's exotic forests had given the company's experts the necessary background for their investigations in New Zealand.

Mr. Skinner continued: "The engineering and the pulping experts who are now visiting New Zealand have made an exhaustive investigation into the physical, technical and engineering problems involved in the whole project. This investigation has confirmed the State Forest Service's belief that, in spite of high capital charges, the local development of newsprint, printings, and writing mills, complete with groundwood and sulphate pulp mills, is entirely economic."

Australian Newsprint Mills, Ltd.

Further details are at hand regarding the overseas visit of S. L. Kessell, managing director of Australian Newsprint Mills, Ltd. He is accompanied by the general manager of the mills, W. R. Henry, and both executives will spend about two months in Canada and the United States. Mr. Henry will then return to Melbourne, but Mr. Kessell will visit in England three weeks before returning to Australia.

Both executives will be studying problems of installing and operating Canadian plants designed for milling softwoods. Suitable plant will be adapted for use on Australian hardwoods.

They will also investigate latest developments in using chemical pulp with the object of enabling the Australian mills to reduce the amount of chemical pulp being imported. At present, short-fibered pulp from Australian hardwoods is mixed with longer-fibered, sulphite chemical pulp made from Canadian spruce. Eventually, it is hoped that chemical treatment of Australian woods will be developed to replace imported pulp.

▼

FINANCIAL

▶▶▶ A SLIGHT RECESSION from the high securities prices of early June marked the latter days of the month. The recession is generally considered to be a rest period during what may be an extended bull market.

Celotex Corporation — Net income for the six months ended April 30, 1948, was $3,359,455 as against $2,912,239 for the same period in the previous fiscal year.

United Board & Carton Corporation —Net income for twelve weeks to May 1 was $203,309 as against $435,526 for the comparable period in the previous fiscal year. Net income for forty-eight weeks to May 1 was $1,199,072 as compared with $1,249,485 the previous year.

Weyerhaeuser Timber Company — Net income for 1947 was $17,913,768 as compared with $12,995,478 the previous year. Pulp and paper mill earnings are not segregated from the company's other operations.

Paper Mill Corporate Changes

Continental Can Company — The Port Leyden mill of the Gould Division has been sold to the Kelly-Forsyth Corporation of Ithaca for the manu-

BARRELL'S

PAPER ANNUAL

1948-1949

WILLIAM L. BARRELL COMPANY
LAWRENCE, MASSACHUSETTS

VOL. VII

1948 - 1949

CONTENTS

Directory of Officials of 34 Paper Industry Associations and other features.

Sent to members of the Paper Industry

WILLIAM L. BARRELL COMPANY
Lawrence, Mass.

Please send copy of 1948-1949
BARRELL'S PAPER ANNUAL

Name _____

Company _____

Street _____

City _____ State _____

facture of specialties. The Gould Paper Company Division is the papermaking branch of the Continental Company.

Wausau Paper Mills Company—D. C. Everest, chairman of the Board of Marathon Corporation has announced the purchase by himself and associates of the Wausau Paper Mills Company. There will be no operating connection between Marathon and Wausau, but the continuance of the Wausau Company business on its former basis will be accompanied by the probable expenditure of considerable funds for improvements.

New York Stock Exchange—Stocks

	Closing Prices June 25, 1948	May 25, 1948
A.P.W. Products	6	6⅛
Celotex	34⅝	32
Same Preferred	18¾	19⅜
Certain-teed Products	18¾	19⅜
Champion P & F Co.	24¾	23⅞
Same Preferred	98¼	*96-100
Chesapeake Corp.	28	*29¾-30
Container Corp.	37⅜	37½
Same Preferred	*98-99	99½
Continental Diamond	11⅝	12⅜
Crown Zellerbach	31¼	33⅞
Same Preferred	100¼	*100-100½
Same $4 Preferred	117	126½
Dixie Vortex	38½	39
Same "A"	*49-50	50½
Robert Gair	9	9¼
Same Preferred	18½	17⅛
International Paper	60	62
Same Preferred	98¼	98
Kimberly-Clark	21	23¼
Same Preferred	101½	101
McAndrews & Forbes	39	3½
Marathon	22	24⅝
Masonite	67½	65½
Mead Corp.	20⅝	22¾
Same Preferred	94¾	*95-95½
Same 2nd Preferred	42	46
National Container	12¼	13
Paraffine Cos.	25½	27¼
Same Preferred	105	*102½-105
Rayonier, Inc.	34¼	32
Same Preferred	37¼	*38¼-37¾
Scott Paper	49½	50
Same Preferred	93	*93-94½
St. Regis	12⅝	13⅛
Same Preferred	98¼	*88½-90
Sutherland Paper	43	42½
Union Bag & Paper	36¾	38⅝
United Bag & Carton	13⅞	13⅞
U. S. Gypsum	110	108½
Same Preferred	176	*178-182
West Va. P. & P.	49	50⅛
Same Preferred	113	108¾

New York Stock Exchange—Bonds

Celotex 3½%	.....	.....
Champion P & F Co.	.....	.....
Certain-teed 5½%	.....	.....

New York Curb Exchange—Stocks

Am Writing	7⅛	7
Great Northern	42¼	41½
Taggart	11	.....

*Closing Bid and Asked Prices

▼

MILLION DOLLAR PROGRAM UNDER WAY AT WATERVLIET

A million-dollar plus improvement program is in progress at the mills of the Watervliet Paper Company, Watervliet, Michigan.

The roof of the coating mill has been raised some 15 feet to make room for the installation of three air doctor coaters with high speed drying tunnels. The new coaters, operating at more than 800 fpm, will replace the mill's nine conventional one side brush coaters, which operate at a little over 200 fpm. One of the new coaters, an 88 inch machine, is now operating while a second of 66 inches is being erected.

Modernization on the smaller (114 inches) of the company's two paper machines has included the installation of a new fourdrinier section, dual press, size press, and an increase of drying capacity. This rebuilding cost more than one and a half times the original cost of the whole new paper machine in 1928.

Other improvements which have been made or are being made include: the starting up of a new pilot pulp mill, built in the last days of the war, which is making semichemical neutral sulphite fiber; new stokers and fly ash collectors for the power plant; and a new washer of improved design for more thorough de-inking of filler fiber extracted from books and magazines.

▼

"BOSS LOGGER" REPRINTED AS BOOK BY WEYERHAEUSER

In the heart of the Douglas fir country, at Vail, near Tacoma, Washington, is a camp operated by Weyerhaeuser Timber Company. In the January 24 (1948) issue of the *Saturday Evening Post* a story entitled "Boss Logger," by Richard Thruelsen, depicted the life of Jim Bates, foreman at the Weyerhaeuser camp.

This story appeared in the *Post* as one of a series of reports on the life and work of men and women in various jobs. It so impressed the Weyerhaeuser company, because of its drama, color and general interest that arrangements were made with The Curtis Publishing Company to reprint the article in book form.

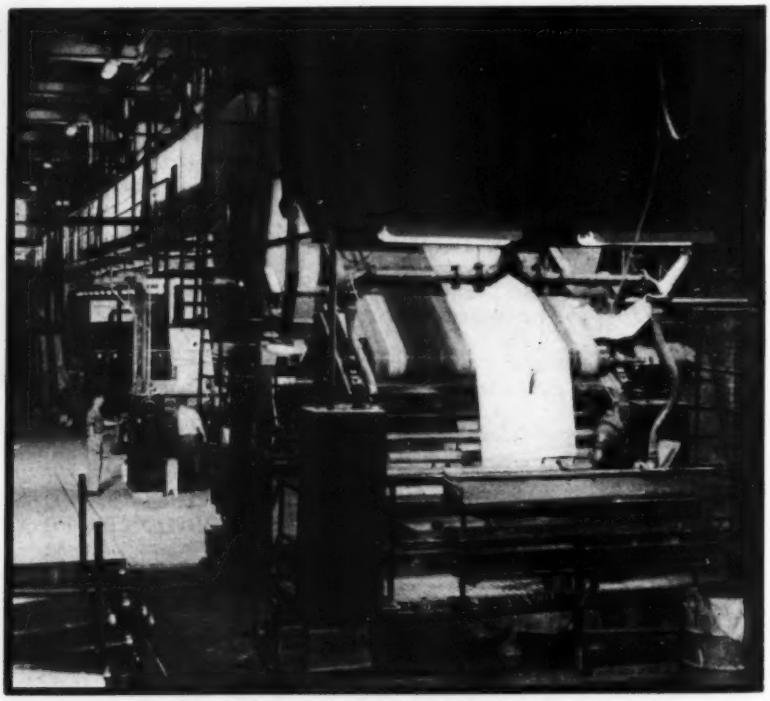
The copy just released is most attractive. Well printed and beautifully illustrated in color it gives a wider distribution to a story that has not been told too often.

▼

IMPORT NOTES

The importation of newsprint counter rolls from Canada as standard newsprint has been questioned by the Import Committee of the American Paper Industry and an investigation is under way. The material is in rolls of 9 inch width, and from 9 to 15 inches in diameter. Warren B. Bullock, manager of the Import Committee, has called to the attention of the officials the fact that newsprint in rolls of less than 28 inch diameter is dutiable as printing paper under the definition of standard newsprint and is not duty free.

Six shipments of rice paper from Japan had been classified as tissue paper, but was claimed by importers to be dutiable as vegetable product at a lower rate of duty. These cases date back to before World War II.



New air doctor coater with high speed drying tunnel just installed at Watervliet Paper Company

Speed Changes are Quick, Exact with *Vari-Pitch* Sheaves!

Speed to Fit the Job!

These roller mills, equipped with *Texrope Vari-Pitch* sheaves for motion control can be set instantly to exact speed for best production under all operating conditions. Can you profit by accurate speed control? *Texrope Vari-Pitch* drives are simply and economically applied to machine tools, pumps, blowers, conveyors or other machines.

Save Money With "Pre-Engineered" Texrope Drives

You can solve 90% of all V-belt drive problems, from 1 to 150 hp, with economical stock *Texrope* V-belts and sheaves. The *one best* drive is selected quickly and simply from a new 144-page manual listing 22,000 "Pre-Engineered" drives. Bulletin 20B6956. ALLIS-CHALMERS, MILWAUKEE. *Texrope, Super-7, Texsteel, Texdrive, Magic-Grip* and *Vari-Pitch* are Allis-Chalmers trademarks.

A Complete Range of Products

Super-7 V-belts	5 types . . . sizes to suit every power transmission job
Texsteel, Texdrive, Magic-Grip	Sheaves in a full range of sizes and grooves
Vari-Pitch Sheaves	Exact variations in speed — Stationary or Motion control
Speed Changers	Speed variations up to 375% at the turn of a crank

Texrope Super-7 V-belts result from the cooperative research of Allis-Chalmers and B. F. Goodrich; and are sold only by A-C dealers and offices.

A 2428

ALLIS-CHALMERS

Originators of the Multiple V-belt Drive for Industry

Customs officials have taken action on a number of importations of special papers in which the reduced rates of duty are affected by the Geneva Reciprocal Trade Agreements. Some of these cases as reported by the Import Committee were:

Serviettes from Sweden have been classified for duty as paper with a printed design.

Creped paper napkins with printed design have been classified for duty as manufactures of paper at 35 per cent, but not less than the crepe paper rate of 3 cents per pound and 7½ per cent.

Imitation leather board, made of leather scrap, known as Salka, was classified for duty at the rate for leather material, not at the lower rate for fiber boards.

Flameproof draperies have been classified as paper with printed design, and not admitted at the claimed lower rate for wallpaper.

Imitation cork gummed cigarette tips have been classified for duty as gummed paper at 5 cents per pound, and not at the higher rate for coated paper or 2½ cents per pound and 7½ per cent.

Laminated paper with one layer corrugated have been classified for duty as paper not specially provided for, and not at the lower claimed rate for wrapping paper.

The United States Customs Court has again ruled that the manner in which prices of kraft paper are controlled in Sweden exempts such paper from duty based on the price in the country of origin, and allows the computation of duty at the actual export price, materially below the Swedish home market price. The decision involved seven shipments of kraft to Jacksonville in 1938.

▼

UNION BAG ENGINEERS DESIGN NEW MACHINE FOR PACKAGING ROCK WOOL

The engineers of Union Bag & Paper Corporation's Packaging Machinery Department have designed a new packaging machine which is successfully packaging rock wool. The company claims that this machine will not only revolutionize the packaging of rock wool, but it may also be applied to many other types of materials of similar characteristics. The machine is being considered for use in the packaging of asbestos fibers, beet sugar pulps, soy bean pomace and other materials, which, because of their fibrous characteristics, it is impossible to anticipate the weight accurately.

The automatic, machine-packaged multiwall kraft bags are rectilinear in shape and of much better merchandising appearance than the hand-packaged bags. It is stated that they are readily palletized aud occupy approximately 10 per cent less space in box cars, trucks, and in storage.

The original machine has been in successful operation in the plant of the National Gypsum Company, in Mansfield, Massachusetts, for which it was originally developed, and at the present time additional machines are under construction and nearing completion.

▼

KIMBERLY-CLARK ISSUES BOOK COMMEMORATING ITS 75TH ANNIVERSARY YEAR

A graphic narrative of seventy-five years of company progress has been put out in book form by Kimberly-Clark Corporation, Neenah, Wisconsin, to commemorate its 75th anniversary. This fine de luxe volume is titled *Four Men and a Machine.*

The book begins with the title—the story of Kimberly-Clark's four founders: Charles B. Clark, John A. Kimberly, Havilah Babcock, and Frank C. Shattuck, and how these men built the first mill at Neenah, Wisconsin, in 1872. From there it unfolds a story of steady, consistent growth and progress despite depression and panic years into a drama of industrial achievement which has placed the K-C Corporation as one of the leading paper manufacturers in this country. *(A review of the company's progress at the close of its 75th year appeared in P.I. and P.W., April, 1948.)*

The book itself is a fine sample of graphic art. Typographically, it is well laid out and printed on fine book paper. There are a large number of illustrations including halftones and wash drawings in color. The stiff cloth cover carries drawings of the "four men" and the title stamped in gold.

▼

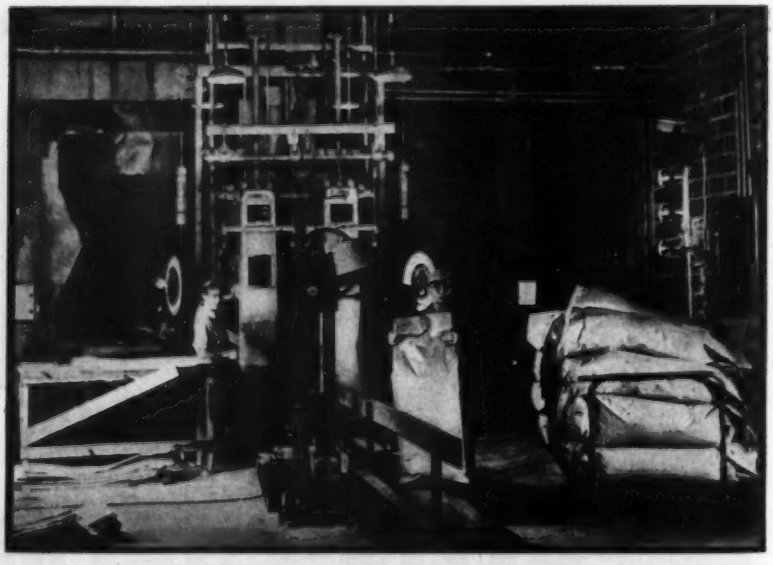
CROSSETT PAPER MILLS WILL DOUBLE FACILITIES

A three-year building program has been begun for Crossett Paper Mills, Crossett, Arkansas, with the recent announcement of contracts covering engineering and construction for the first phase of the expansion.

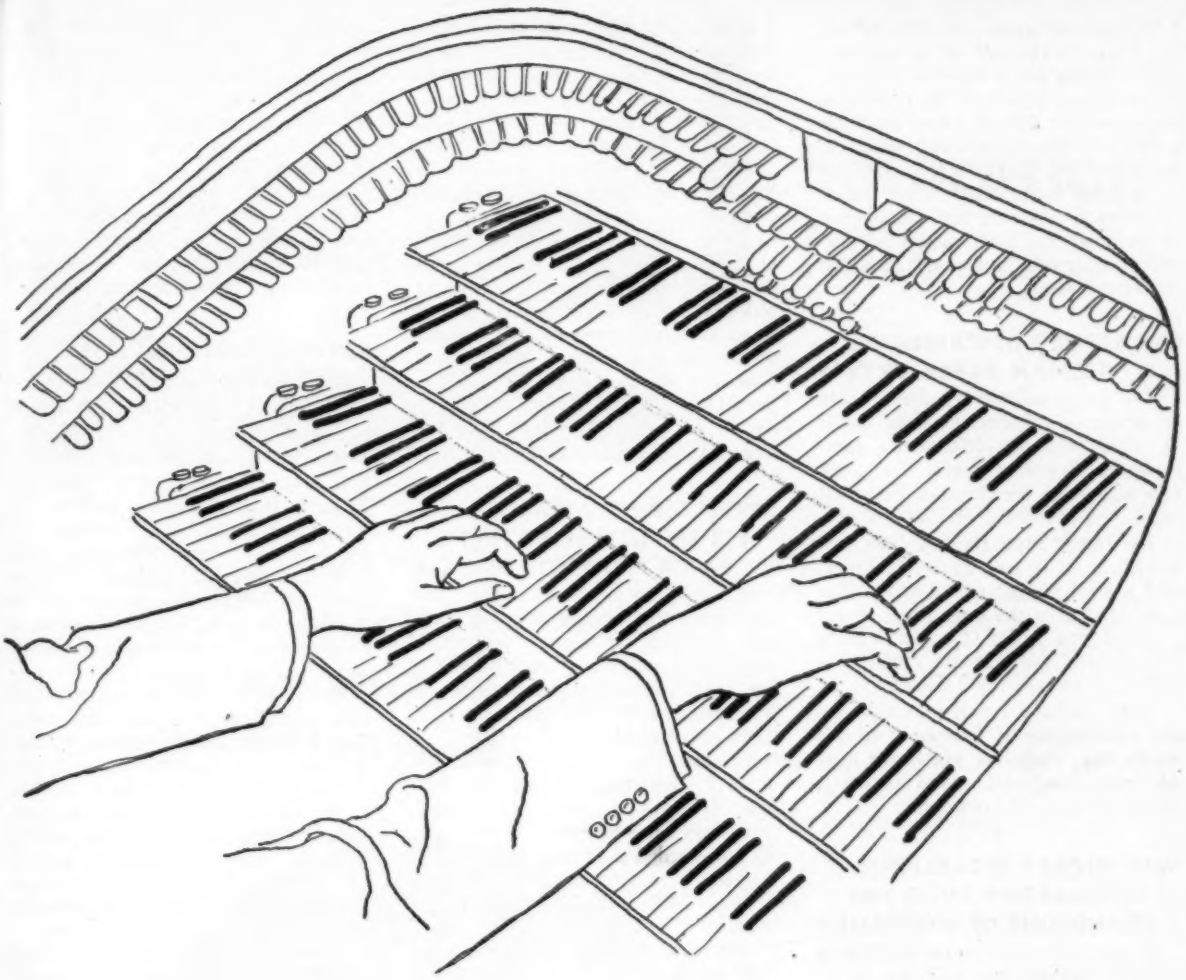
The entire program will nearly double papermaking facilities at the mill. Initial contracts, awarded The Rust Engineering Company, Pittsburgh, provide for a new two-story personnel building, an addition to the digester building and new paper machine installation with auxiliaries. Engineering is under way and construction has begun.

The personnel building, to provide modern facilities for 900 men, will have radiant heat, individually ventilated lockers, glazed tile walls, sanitary floors, and a covered passage from employees' parking lot. It will include a waiting room, and personnel director's office located so that all workmen will pass his door at every shift change.

The digester building extension, to be built of steel and brick, will house three additional digesters, increasing the total number from five to eight. The digester extension and personnel building are expected to be completed in November, 1948.



New machine designed by engineers of Union Bag & Paper Corporation uniformly fills multiwall kraft bags, and it has been used successfully in packaging rock wool, the packaging of which requires a great deal of care in the amount of compression applied to the material packaged



....just like playing an organ

To be able to step to a control board
and direct the operations involved in the preparation
of the stock and the forming of
the product is akin to an organist at his console.
Shartle and Dilts engineer and install
preparatory systems with push-button control and
Black-Clawson do likewise in the machine room.
At your Service at any time.

Shartle Bros. Machine Co., Middletown, Ohio
Dilts Machine Works, Fulton, New York

THE BLACK-CLAWSON CO. (ENGLAND) LIMITED, MORDEN, ENGLAND
Divisions of
THE BLACK-CLAWSON COMPANY, HAMILTON, OHIO
Associate: Alexander Fleck Limited, Ottawa, Ontario, Canada

Design has begun and construction will begin in the fall on an addition to the existing paper machine facilities, as the second phase of the expansion program. The present paper machine building will be lengthened to accommodate a 210-inch high speed machine for making light weight kraft paper.

Contracts covering the installation of the remaining pulp making and refining equipment are expected to be announced soon.

▼

OTS REPORT DESCRIBES GERMAN PAPER DRYERS

The design and construction of large paper drying cylinders made by the J. M. Voith firm in Heidenheim, Germany, are described briefly in a report now on sale by the Office of Technical Services, Department of Commerce.

The largest dryer the firm built had a diameter of 16 feet, a face of 15 feet, and a total weight of 72 tons. The shell for one of the large paper dryers required two ladles of approximately 30 tons each, and the entire casting was poured in less than one minute.

The illustrated report also discusses the manufacture of fiberboard by the Voith firm, including fiberboard used for heat insulation, sound proofing, and as a substitute for wood.

▼

WM. HICKEY ESTABLISHES SCHOLARSHIP FUND FOR GRANDSONS OF WOODSMEN

A man who never forgot his friends of half a century ago will long be remembered by their grandsons. He is William Parker Hickey, senior partner of the investment firm of Hickey-Donaldson in Montreal, and he recently set up a $25,000 fund to provide scholarships at the University of New Brunswick for forestry students.

The scholarships will be given to students of the New Brunswick counties of Kent, Northumberland, Gloucester and Restigouche, whose grandfathers have worked in pulp or sawmills or in any branch of woods work.

Previous to entering business in Montreal, Mr. Hickey had been employed at the Adams House at Chatham, New Brunswick, the mecca of men engaged in the lumbering industry, and his nostalgic memories of old-time woodsmen prompted him to establish the scholarships in their honor and for the benefit of their grandsons. The awards will be known as the Tom Hickey Scholarships after a member of Mr. Hickey's family who was engaged in the lumber business.

▼

SERVICE PINS AWARDED 143 EMPLOYEES BY NAT'L PAPER PRODUCTS DIV. C-Z

Service pins were awarded to 143 employees of the National Paper Products Division of Crown Zellerbach corporation, Carthage, New York, at the firm's annual banquet on June 23. The presentation was made by J. E. Hanny, corporation vice president.

Leading the list of veteran papermakers who received pins for their years of continuous service to the company was Fred Bingle, the only man to be awarded a 40-year pin. Thirty-five year pins went to three employees —Fred Miller, Emory Persha, and Roswell Prievo.

Raymond J. Schadt, resident manager of the Division, acted as toastmaster at the banquet. Officials of the company present at the dinner were Wayne A. Brown, eastern divisional manager, and John Frost, general sales manager and former Carthage resident.

Prior to awarding the 143 service pins, Mr. Hanny complimented the employees for their safety record, for the clean and orderly condition of the plant, and the co-operation that had existed between management and the two labor unions in the plant.

The C-Z vice president reviewed the postwar expansion program of the corporation and expressed his assurance to the Carthage employees of the security offered by the firm, stressing the need for continued labor co-operation in the future expansion of the organization.

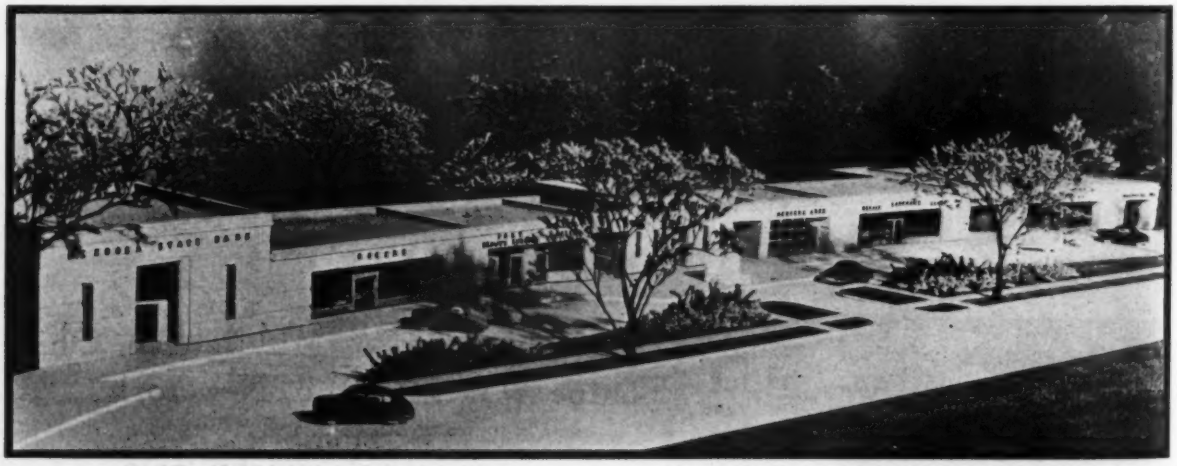
▼

NEPCO BEAUTIFICATION AND CIVIC IMPROVEMENT PROGRAM IS UNDER WAY

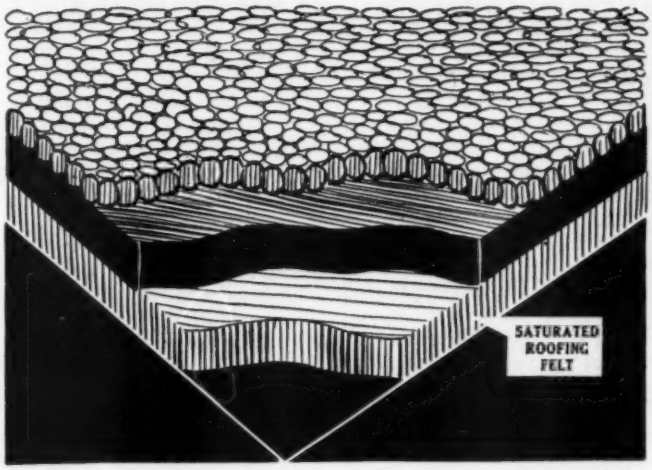
One of the major steps in the $350,000 civic improvement and beautification program sponsored by Nekoosa-Edwards Paper Company, in Port Edwards, Wisconsin, is now under way. On June 23, John E. Alexander, company president and general manager broke ground for the construction of the new shopping center building to be erected on the south side of Market Street in Port Edwards.

The structure will be composed of nine commercial and municipal units. It will be 408 ft. long with an average depth of 50 ft., and will be built with a concave front curved on a 1000-ft. radius. It will be surrounded by park area and there will be ample parking space for cars. The building will be 100 per cent fireproof, and will have the most modern features in construction, interior finishing and lighting.

A branch of the Nekoosa State Bank of Nekoosa, Wisconsin, will occupy the dominant position at the east end of the building, bringing banking facilities to the village of Port Edwards for the first time. The entire space occupied by the bank will be completely bandit proof. There will be stores, supermarkets, beauty shop and barber



Model of the Port Edwards (Wis.) Shopping Center, which will house nine commercial units and will completely replace the shopping district of the paper mill town with one of the newest and most modern shopping centers of its kind in the country



Saturating felts . . .

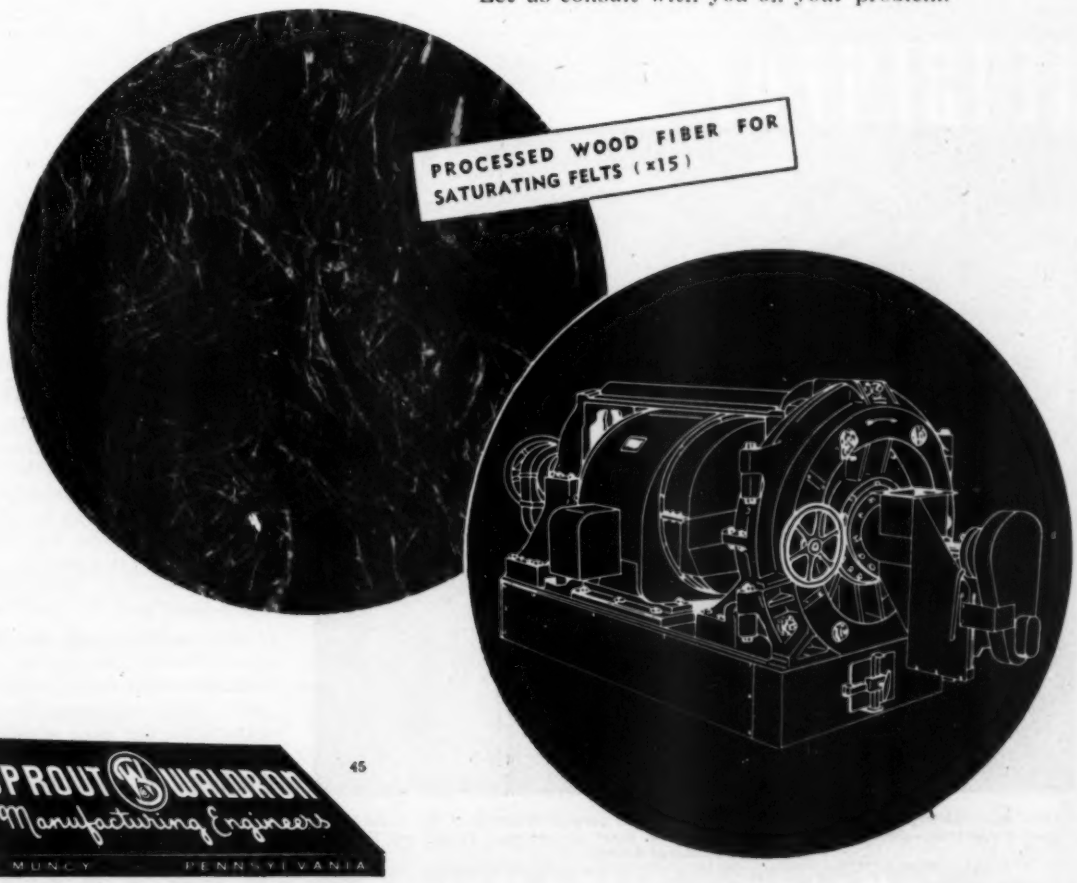
with high wood-pulp additions.

Because of lower manufacturing costs, modern dry felt producers are looking to wood pulp as a partial replacement for rags in the furnish.

On this service, Sprout-Waldron Refiners are the natural complement to the preliminary attrition of the heat and chemically softened wood chips. They assure high tonnages and discharge the pulp as slender fibers without degradation.

In felt production, S-W Refining improves quality and uniformity of saturation. Excellent folding properties are maintained.

Let us consult with you on your problem.



SPROUT WALDRON
Manufacturing Engineers
MUNCY PENNSYLVANIA

45

shop, drug store, restaurant, and a medical building with facilities for doctor and dentist.

This building represents more than two years of planning. The actual plans were drawn by Donn Hougen, Wisconsin Rapids architect. A scale model representing approximately four feet per inch has been constructed by the Roycraft Model Company, of Green Bay, Wiscsonsin, and is on display in Port Edwards.

▼

TIMBER-CUTTING RIGHTS GRANTED EASTERN PAPER CORP. ARE RESTRICTED

Recently an announcement was made by Clyde B. Morgan, president of the Eastern Corporation, and Curtis M. Hutchins, president of the Dead River Company, both of Bangor, Maine, that should be of interest to all who desire the promotion of sound forest conservation practices.

One of New England's largest timber owners, the Dead River Company, has granted exclusive timber-cutting rights on 100,000 acres of its property to Eastern Corporation. The details embodied in the agreement restrict the cutting to carefully defined areas, in accordance with the best sustained yield practices. The cutting schedule is designed not only to promote sustained yield but to build up an already well-stocked area by limiting the annual cutting to three-fourths of the annual growth.

The Dead River Company will receive from Eastern Corporation a yearly license fee apart from payment for timber cut, which it agrees to reinvest in the project, partially in the construction of a 30-mile year-round trunk road system and partially in forest-management studies under the direction of Dwight B. Demeritt, its woodlands manager and recent head of the University of Maine forestry department.

The areas involved are in Penobscot County, Maine, within trucking distance of Eastern's Lincoln mill and within 70 miles of its South Brewer plant. This backlog of standing timber will assure William E. Eggleston, Eastern's Woodlands Manager, of a permanent supply of large cordages of pulpwood. The agreement terminates at the end of ten years, but provision has been made for renewal periods of ten years each.

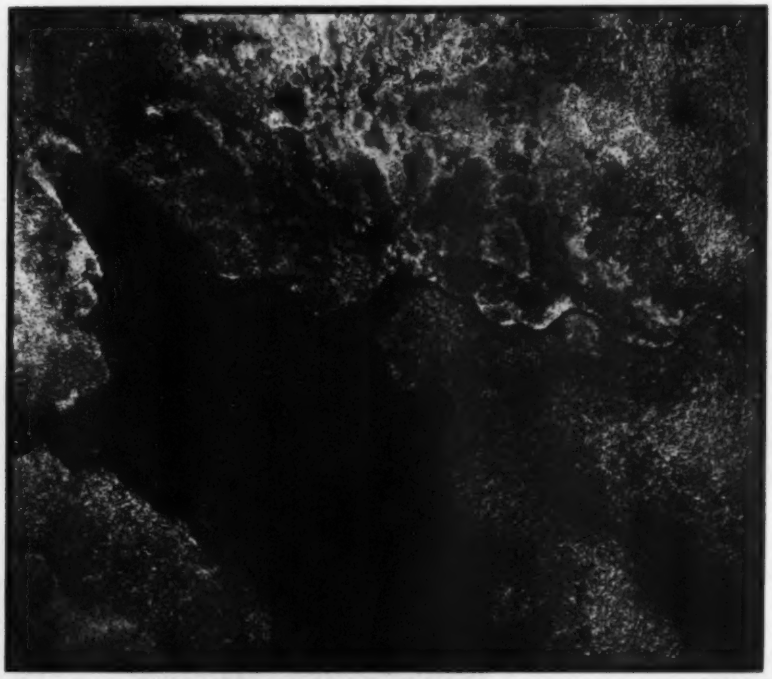
Cutting areas will be allocated five years in advance and cuttings thereon will be limited to three-fourths of the annual growth of the whole property during that period. This is the first large-scale commercial arrangement since early lumber days to restrict the cutting of spruce, hemlock, and pine pulpwood to trees larger than 10 inches in diameter, reserving the smaller trees for future operations. Such a plan for conservation will result in a continuous increase in the growing stock of trees and will stimulate growth to a point where this area will be producing the maximum amount of timber.

During the early years of the agreement, forestry work will be concentrated on growth studies and will include the setting out of permanent sample plots which will be studied at regular intervals; and of equal importance will be the development of the best possible fire-protection system.

This agreement increases Eastern's holdings to a point where it owns or leases 386,000 acres of scientifically managed timberlands in Maine and Nova Scotia and has cutting privileges or rights on 115,000 acres, or a total supply of 501,000 acres.

The arrangement between the Eastern and Dead River Corporations is the first of its kind in the Northeast. It is to be sincerely hoped that it will not be the last—that the lumber and paper companies and industries who depend and will continue to depend on wood and wood pulp will work along the lines of the policy embodied in this contract.

If we are to "keep America green," we must look to our forest farming. The renewable natural wealth of our commercial forests will yield bountifully with the kind of care provided by contracts of this nature. It is only by such thinking and action that the vital timber resources of this country can be developed and preserved rather than depleted.



Vertical aerial photograph showing heavy timber, lakes and general character of the forest in the Eastern Corporation—Dead River agreement. The dark areas are softwood timber and the light areas are hardwood timber

▼

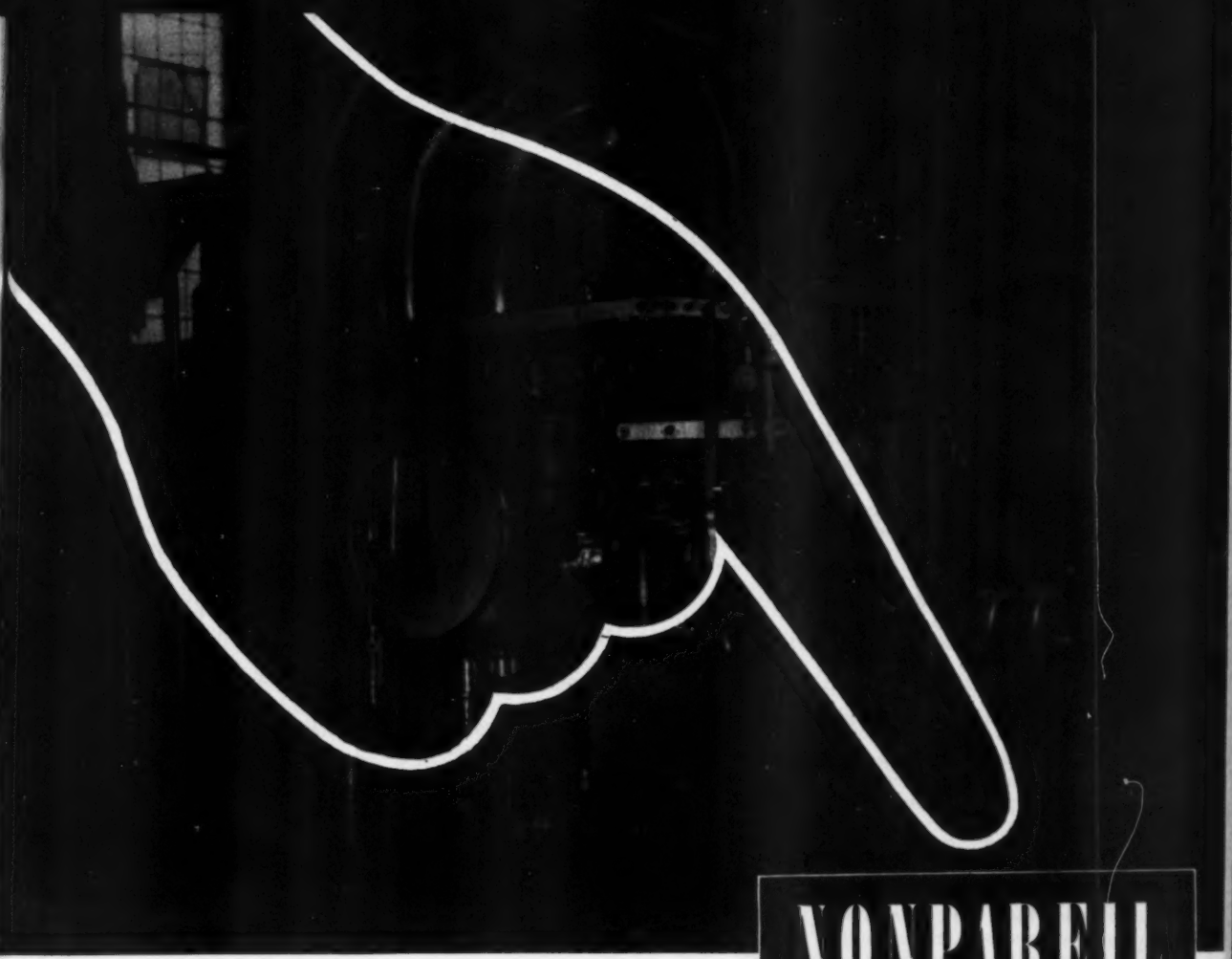
▶▶▶ THE CONSTRUCTION of a wood-pulp mill and a paper-manufacturing plant in the state of Chihuahua, Mexico, is a project being studied by the Union de Madereros de Chihuahua (lumbermen's union). The initial investment will be about 4,000,000 pesos, according to the union's estimate.

▼

MARATHON BUILDS PLANT FOR MANUFACTURE OF INK

Construction of a new, modern building to house ink manufacturing operations has been started by Marathon Corporation, Menasha, Wisconsin. The line of inks to be manufactured for Marathon and other users includes letterpress inks for carton and wrapper printing, offset, rotogravure and aniline inks.

The building will provide 28,000 square feet of floor space in a one story structure. Built of reinforced concrete, steel, brick, and glass, the plant will incorporate the most advanced principles of line production in its layout for ink manufacturing. Complete equipment and facilities for mixing and grinding all types of ink will be installed.



NONPAREIL
TURBINE OIL

5 safeguards against outages

Under varying service conditions one or all of these turbine-oil qualities can bring added dependability to your turbine operation.

1. ***Nonpariel does not form asphaltic deposits.*** Delicate governor parts, oil lines, and bearings stay clean because the refining process removes from the oil all asphaltene-forming hydrocarbons.

2. ***Nonpareil does not increase in acidity*** above 0.15 mg.KOH/gm no matter how long it is left in a turbine. This is *guaranteed* in writing.

3. ***Nonpareil does not need to be removed from the turbine for treating, resting, or replacing.*** There are no interruptions to turbine operation because of oil deterioration.

4. ***Nonpareil resists foaming.*** It contains an antifoam additive which prevents oil overflow, eliminating loss of oil and a potential fire hazard.

5. ***Nonpareil contains a corrosion inhibitor*** and passes A.S.T.M. D 665-46T test for corrosion resistance.

20 years of operation prove that Nonpareil-lubricated turbines require no outage time for oil-system maintenance. You can check this fact with nearby users of Nonpareil. A Standard Oil Lubrication Engineer will identify them for you. Write Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois, for the nearest Engineer.

STANDARD OIL COMPANY (INDIANA) STANDARD

Washington News

PRESIDENT SIGNS RTA

President Truman on June 26 signed the Reciprocal Trade Agreement bill as passed by Congress, but in doing so criticized Congress for the changes in the original measure. The original proposal of the Administration was for a three-year extension of the power of the Administration to make changes in Tariff rates, continuing the authority which expired June 12. Congress, however, refused to grant this extension and the measure as finally enacted limited the authority to make reciprocal agreements changing rates of duty to one year but with rigid limitations to protect domestic industry against injury.

Under the modified Act, responsibility for much of the trade agreement program is transferred to the United States Tariff Commission, which is required to make prompt analysis of any proposed trade agreement to determine whether the suggested changes would result in injury to domestic industry. The President is authorized to make duty rate reductions as his judgment dictates but if he proclaims any changes in rates of duty beyond the "peril point" set by the Tariff Commission, he is required to report any such changes to Congress. As originally passed by the House of Representatives, any such reductions would be subject to congressional review, and would not become effective until Congress had an opportunity to veto any changes it deemed dangerous to domestic industry. As the measure passed the Senate, and later was approved by the lower house, the power of veto is omitted, but the presidential report is required in case of divergence from Tariff Commission recommendations.

In his message signing the modified act, the President stated he proposed early negotiations with countries not parties to the Geneva agreements. Such additional agreements might include Finland and Sweden. Wrapping papers of all kinds might become subjects for further duty rate reductions in case of negotiations with these two outstanding paper and pulp producing nations.

The President's message probably will mean the injection of the Reciprocal Trade Agreement issue into the fall election campaign, even though the Republican platform adopted at Philadelphia last week approves the broad principle of reciprocal trade relations.

The final passage of the 1948 Trade Agreement Act marks the first step toward giving domestic industry protection against arbitrary administrative tariff rate reduction. The Reciprocal Trade Agreement program was initiated in the early days of the Roosevelt regime, when Congress in 1934 surrendered its constitutional tariff making powers to the Administration. A series of agreements went into effect, the first of which affected wrapping, printing and many paper grades of lesser tonnage. The earlier agreements limited reductions to 50 per cent of the rates in effect under the Tariff Act of 1930, but a revision of the Act in 1945 authorized a reduction of 50 per cent from the rates in effect January 1, 1945. This made it possible to again cut in half rates already reduced 50 per cent, or a total reduction of 75 per cent in the rates of duty originally fixed by Congress. The original legislation deprived domestic producers of the right of appeal to the courts against any adverse action by the Administrative agencies, and this prohibition still exists.

Under the law as previously administered, the State Department was given authority to negotiate any rate changes. Industry's only opportunity for a hearing was before the Committee for Reciprocity Information, in which various Administrative agencies were represented, the Tariff Commission being one member.

The extension of the Trade Agreement Act for one year is quite generally understood to be a temporary measure pending an intensive study of the entire question of scientific tariff legislation which may be expected to come before the next congress. A first step in this direction has already been made by the introduction by Congressman Gearhart of a measure to revamp the United States Tariff Commission and give it principal authority for tariff rate modifications, to permit flexible adjustments required by changing world conditions, and to eliminate some of the injustices in the existing law.

CONGRESS WILL BE ASKED TO REVISE ANTITRUST LAW

Recommendations for a far-reaching revision of the antitrust laws will be presented to Congress early in the 1948 session. The House Small Business Committee plans hearings in more than a score of cities to learn both sides of the picture-complaints from small business against price fixing operations and complaints from the other side on the rigorous manner in which federal authorities have been attacking various industries. Meanwhile the Senate will have a subcommittee of the Interstate Commerce Committee survey the impact of recent court decisions.

These investigations will take up the issues raised in a series of recent decisions, not the least being one affecting the book paper manufacturers, in which various practices have been held to be illegal. The new problem of antitrust legislation rose when a ruling was issued in the cement industry involving in part the zoning system of adjusting price differentials.

In 1945, the Federal Trade Commission ordered the Book Paper Manufacturers Association to cease and desist from various activities, the case involving forty-two manufacturing companies. The industry petitioned the United States Circuit Court at Chicago for a review of the order, and on June 19 the Court sustained the order, thereby carrying over to the paper industry the principles which it had originally approved in the cement and other cases. In the final decision Consolidated Water Power and Paper Company of Wisconsin Rapids (Wis.), was exempted as not party to the activities charged against the others. The activities complained of included the publication of price changes by individual companies, and the use of certain trade customs.

At Philadelphia, a group of seven corporations manufacturing vulcanized fiber and related products have entered pleas of innocence to charges of violating the antitrust laws.

The Wall Paper Institute and a group of domestic manufacturers have also been cited under similar charges.

Many other industries outside of the paper industry are expected to be under charges involving the use of basing point systems, and this long series of cases is the justification for the pending congressional inquiries. Industry charges that the Federal Trade Commission has gone too far afield in its interpretation of the antitrust laws will be heard.

FOREST SERVICE REOPENS ALASKAN TIMBER BIDDING

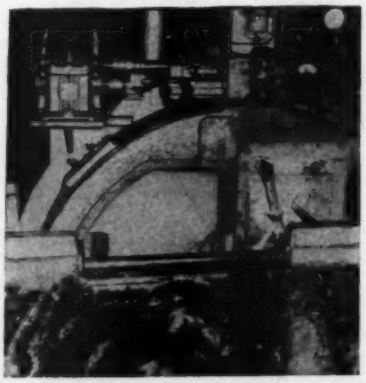
The Forest Service of the U.S. Department of Agriculture has called for bids on 8,000,000 board feet of pulp timber near Ketchikan, Alaska, in a second attempt to establish a pulp and paper industry in the territory. The same timber was offered last year, as was a similar area near Thomas Bay and Petersburg, but no bids were received (Cf. P.I. and P.W., October, 1947, p. 934).

This time the Forest Service expects to get results. The proposed new 50 year contract will expire in 2002, instead of June 30, 2000, and a provision gives assurance that additional timber will be available on reasonable terms after 50 years. Bidders must submit evidence of financial ability on or before July 19. Oral bids will be received and sealed bids opened August 2.

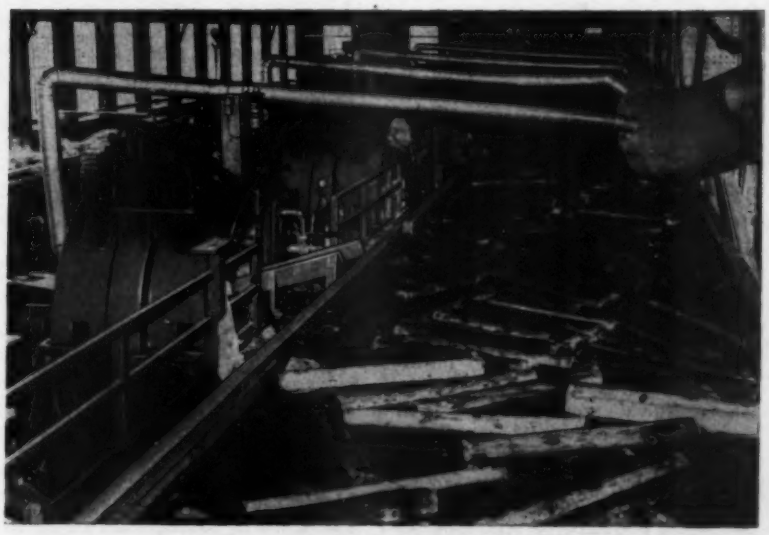
EASY LOADING

CUTS GRINDER ROOM CREWS 50% TO 70%

Pulpwood is floated right up to the charging door of the Roberts Grinder when the water conveying system is used. The operators have only to guide the wood from the pond into the spouts down to the feed pockets. This easy loading feature of the Roberts Grinder, with its large daily tonnage, helps cut grinder room crews fifty to seventy per cent. Thousands of man-hours are saved annually. On a typical installation of eleven units, only 30 men were needed, including maintenance and supervision, while 82 men were required for the pocket grinders that were replaced. By grinding four and five foot wood additional labor savings are effected in handling and preparation. This considerable cut in labor means a real saving in the cost per ton to manufacture groundwood pulp. Other types of efficient wood conveyors, fitting the individual requirements of each mill, are easily adapted to the Roberts Grinder for low cost, labor saving loading.



The operator's side of a Roberts Grinder while in operation, from an unretouched photograph. Note—that while steam fills the inside none is escaping out of the open charging door. An exhaust system, shown in the larger picture, draws off steam and vapors and discharges them outside the building.



ROBERTS GRINDER

THE APPLETON MACHINE COMPANY • APPLETON • WISCONSIN

Eastern Sales: CASTLE & OVERTON, Inc., 630 Fifth Avenue, New York • Western Sales: PACIFIC COAST SUPPLY CO., San Francisco, Portland

▶▶▶ CONFERENCES AND studies of the possibility of using timber from extensive stands in Colorado and Eastern Montana have resulted in the issuance of a report giving details of the timber resources of the region, operating conditions and the like. Preliminary studies by paper mill interests had indicated that extensive stands of suitable pulpwood could be made available in the national forests of those states.

INVESTIGATION BY STATE DEPT. MAY BRING TAX ON IMPORTED SWEDISH PULP

The State Department has informed domestic paper mill interests that it is investigating the Swedish pulp situation, in view of the imposition of a tax of $14 per ton on pulp for export to the United States. The Department says that it has succeeded in preventing the increase of the tax, but that there is no present ground for formal representations to Sweden against the imposition of the tax. The Department took this opportunity to advocate the adoption of the I.T.O. Charter by stating that under such a charter there would be a formal procedure for making complaints against such operations are the pulp export tax.

▶▶▶ THE DEVELOPMENT OF the Economic Co-Operation Operation has included the appointment of J. D. Zellerbach, President of Crown-Zellerbach Corporation, as chief of the special mission to Italy.

▼

VALUE OF NEW BRUNSWICK FORESTRY CITED BEFORE FIRE PREVENTION ASS'N

The great value of New Brunswick's forest lands and the grave danger of forest fires to the future economy of the province were stressed to delegates attending the 30th annual convention of the Dominion Fire Prevention Association and the Association of Canadian Fire Marshals at a dinner meeting in Saint John. The speaker was Senator G. Percy Burchill, long prominent in the New Brunswick lumber industry.

"The annual crop from New Brunswick's 14 million acres of forest lands supply pulp mills, saw mills, woodworking plants and lumber exporters with wood to the value of $123,000,000. It is not hard to see," Senator Burchill said, "that our citizens, merchants, professional men and transportation companies, as well as our institutions, are linked up with the forest industry of the province."

The speaker warned that the province's forests were being burned up at the rate of 60,000 to 70,000 acres annually.

GOULD PAPER COMPANY SELLS PORT LEYDEN MILL TO KELLY-FORSYTH CORP.

The Gould Paper Company (Lyons Falls, N.Y.), a division of the Continental Can Company, Inc., has sold its mill at Port Leyden, New York, to the Kelly-Forsyth Corporation, of Ithaca, New York.

The Port Leyden mill, formerly utilized by the Gould company in manufacturing groundwood specialties, has been idle for about six years, but will immediately be put into operating condition by the new owner for the manufacture of a line of tissue specialties.

Officers of the comparatively new Kelly-Forsyth Corporation are John M. Kelly, president, and William L. Forsyth, secretary.

▼

ARMSTRONG CORK CO. UNIT PLANTS SEEDLINGS

As a first step in growing and conserving pulpwood trees, the Armstrong Cork Georgia Tree Farms, Inc., distributed 75,000 loblolly pine seedlings which were obtained from the Georgia State Department of Forestry. Many more seedlings were distributed to landowners in the Macon area.

The Tree Farms corporation is a subsidiary established in 1947 by the Armstrong Cork Company (Lancaster, Pa.) to manage the local timberland which will eventually supply about 50 per cent of the pulpwood needs of the company's new fiberboard plant in Macon.

The subsidiary is headed by E. A. Worm, Jr., who also is manager of the Armstrong plant in Macon. Staff members who are conducting the conservation program include Forester and Wood Procurement Manager J. D. Fountain and Assistant Forester W. E. Oppenheim.

▼

EMPLOYMENT OF GRADUATES DISCUSSED BY MARITIME SCHOOLS AND PAPER MEN

Representatives from all Maritime universities and officials of every large pulp and paper concern in the Maritime provinces met recently at Mount Allison University, Sackville, New Brunswick, to discuss the requirements of graduates who are to be taken into the industry.

The meeting was held under the chairmanship of W. H. Birchard, chairman of the educational committee for the Maritimes and Newfoundland branch of the technical section of the Canadian Pulp and Paper Association. The pulp and paper industry, chief employer of college graduates in the eastern Canadian provinces, believes that it can materially aid the universities by closer liaison in keeping them advised of the latest advances in the industry. Plans for providing summer employment for undergraduates were also discussed at the one-day round table conference.

▼

KIMBERLY-CLARK RENEWS RESEARCH FELLOWSHIPS

Kimberly-Clark Corporation, Neenah, Wisconsin, has renewed its research fellowships at the University of Wisconsin and Massachusetts Institute of Technology for the 1948-1949 school year, according to H. A. Rothchild, technical director of Kimberly-Clark and chairman of its committee on fellowships.

Under the fellowship agreements, which were instituted first by the corporation in 1946, funds are provided to finance the studies of graduate students in a subject of interest and value to the pulp and paper industry. Selection of the student who receives the benefit of these funds, and the specific subject of his study are made by the school concerned.

▼

ZELLERBACH CO. PLANS SALT LAKE CITY OFFICE

Plans of Zellerbach Paper Company, San Francisco, for the construction of a new divisional office and distributing plant in Salt Lake City, Utah, have been announced. Bruce C. Garrison is division manager.

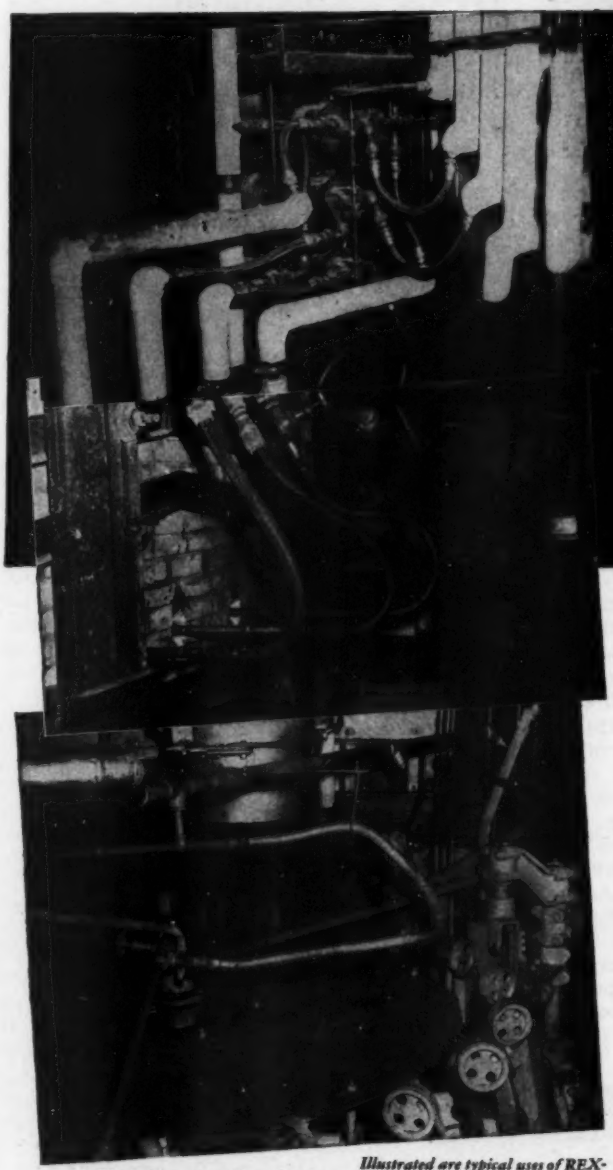
The one-story structure and its grounds will cover approximately 1½ acres at 22nd South and 3rd East, Salt Lake City. Features of the new building will include use of glass brick to the exclusion of windows, fluorescent lighting and electronic precipitation system to clean air. A railroad spur track will serve the building.

Plans call for a large, modern sample room where all products which the division distributes will be displayed for the convenience of customers. Expansion of the division is part of an overall building program. A new branch of the Salt Lake City division was opened recently in Pocatello.

▼

▶▶▶ A MAGNETIC CLUTCH developed recently at the National Bureau of Standards is outstanding in a fifth list of 74 U. S. Government-owned inventions suitable for foreign patent filing which may be obtained on request to John C. Green, Director, Office of Technical Services, Department of Commerce. The clutch makes novel use of fluid and magnetic principles for power coupling and has a wide variety of potential mechanical applications.

CMH REX-WELD
corrugated flexible metal hose



the answer to leak proof conveyance of high pressure, high temperature liquids and gases

Illustrated are typical uses of REX-WELD. Top, *steam lines;* Center, *gas lines;* Bottom, *compressed air lines.*

REX-WELD sets the standard for corrugated flexible metal hose. Formed from strip by advanced methods, it offers greater uniformity than is otherwise possible.

Made in both bronze and steel with helical or annular corrugations, braided or unbraided. It is particularly suited for installations where vibration is a problem or where hose is subjected to prolonged flexing or bending.

The range of applications for REX-WELD is virtually unlimited. It is capable of handling pressures to 6000 psi. and temperatures to 1000°F. Leakproof for searching liquids and gases.

Ask for data sheets and specifications, today. For corrosive services ask about REX-FLEX Stainless Steel Flexible Hose and Tubing.

"FLEXON" identifies CMH products, which have served industry for more than 45 years.

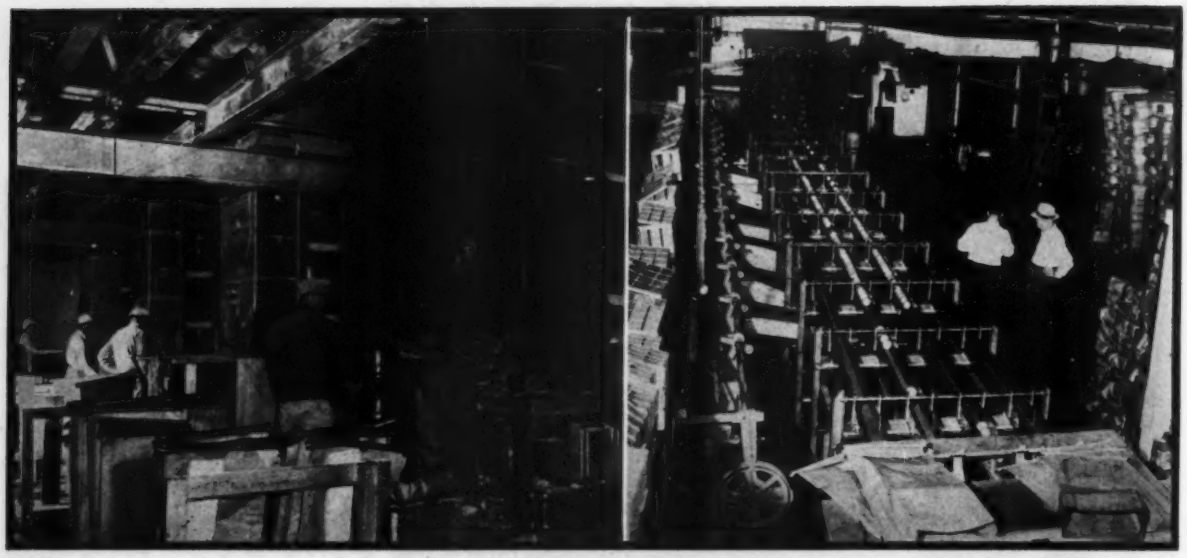
"the science of FLEXONICS . . ."the controlled bending of thin metals for use under varying conditions of temperature, pressure, vibration and corrosion" . . . is exemplified in the basic products of Chicago Metal Hose Corporation.

CMH FLEXIBLE METAL HOSE

CHICAGO METAL HOSE CORPORATION

Maywood, Illinois

Plants at Maywood, Elgin and Rock Falls, Illinois



LEFT—The new battery of four St. Regis bag filling machines at National Biscuit Co. (Toledo, Ohio). These packers are capable of dropping 24 bags of flour a minute on a single conveyor belt which carries the bags direct to the railroad siding . . . RIGHT—Oranges are brought by conveyor to an automatic packer for packaging citrus fruit in a new multiwall paper bag container, the Citrobag. Both the packer and the bag were designed and developed by St. Regis Paper Co.

St. Regis Develops Citrobag—System for Packaging, Handles 400 Commodities

Less than a quarter of a century ago, the multiwall paper bag found its first major market in the cement industry. Since then, this multiwall bag has become widely used as a container for sugar, flour feeds, chemicals, fertilizers and many other commodities. Some 400 commodities are now being packaged industrially in these paper bags.

In the milling industry, it is stated that about 57 per cent of the paper bags in which flour is currently being packed are valve bags, against 46 per cent in 1947. The ratio of valve bags is rising steadily, reflecting the unique advantages of the packaging system for flour developed by the St. Regis Paper Company.

There are today 172 St. Regis flour packers in use. The installed St. Regis' flour packing equipment during 1947 packed bakery flour in 24 million valve bags. The St. Regis packaging system, utilizing the company's flour packer and multiwall valve bags, provides a sanitary pipe line from mill stream to bakers. The need for meeting the two basic requirements of sanitation and economy has led inevitably to the St. Regis' streamlined packaging system used in many of today's modern flour mills. The largest automatic packaging system functioning in the flour milling industry recently has been installed by the Engineering Division of St. Regis Paper Company in the mill of National Biscuit Company, Toledo, Ohio.

The entry of St. Regis into the citrus field with a specially designed multiwall paper bag and mechanical packer, will, it is stated, modernize the packaging operation in the citrus industry.

Called the Citrobag, the new chemically-treated multiwall bag developed by St. Regis for the shipment of citrus fruit is made up of four plies of kraft paper. It has a capacity of approximately 45 pounds, or half that of the traditional wooden box. The inner wall of the Citrobag is a chemically-treated kraft paper which, experiments have revealed, successfully prevents deterioration and substantially reduces shrinkage in the fruit. Next comes a ply of paper specially-treated to hold the chemical vapor within the closed space. The two outside sheets are made of wet strength paper, treated with a compound that resists the effect of citrus juices.

Illustrated here is the Citrobag packaging fruit; the packer shown was developed by St. Regis.

▼

WEST VIRGINIA BECOMES 20TH TREE FARM STATE

West Virginia officially became the twentieth Tree Farm state in the nation on May 22 when the 41,000 acre New River Company Tree Farm was dedicated near Beckley, West Virginia. This state's entry into the Tree Farm System brings the national total to 15,211,851 acres.

The Tree Farm dedication came as the climax of the first annual meeting of the West Virginia Forest Council which was organized a year ago as a co-ordinated group to work on the forestry problems facing West Virginia. The Tree Farms in West Virginia are sponsored by the council in co-operation with the Conservation Commission of West Virginia and the Appalachian Hardwood Manufacturers, Inc.

▼

BRITISH PAPER NOTES (May, 1948)

The promise of slightly larger quotas for home consumption during the next license period now appears more hopeful. Already a preliminary report has appeared to the effect that the allowance of newsprint and other papers for general periodicals is to be raised from 31½ to 35 per cent of prewar consumption and for trade journals from 35 to 38½ per cent. This increase of approximately 10 per cent in newsprint supplies among other papers to these particular fields is surprising in view of the fact that there has been a suggestion that newspapers, for which the quota is already down to 28 per cent, may be still further cut. As such a cut in newsprint purchases from North America would be the third within twelve months, it is understandable that a statement has appeared from Canada warning Great Britian that if newsprint purchases are again cut, she may find it difficult to restore, let alone increase, her purchases at a later date.

To the ordinary trader outside political interests it is extremely difficult to understand what is happening. At the Labor Party's recent annual confer-

The days are getting longer!
The length of a day in any paper or board mill is measured by the amount of tonnage produced in it. Production is controlled by machine speed and this is determined by the efficiency of overall drying.
Every machine represents invested capital. Every one costs so much per hour, whether it is "down" or operating. The faster it runs —the longer the day.
Equip one of your machines with properly selected Hamilton Felts. Equip another machine with felts of any other make. Run both machines. Compare the outputs.
• From the thinnest tissue to the heaviest board there is a Hamilton Felt that will increase the length of your productive days.

SHULER & BENNINGHOFEN, HAMILTON, OHIO

• Miami Woolen Mills •

Hamilton Felts

• Established 1858 •

ence, references of an extremely hostile nature were made by at least one responsible member of the Government to the national press. This almost immediately followed the news that paper supplies might be cut to newspapers, yet increased quantities of this same class of paper were being proposed for journals. Concurrently under present Control Orders no newspaper can consume more than 8 cwt. of paper per license period (four months), yet it is reported that the Socialist Party is making arrangements for no less than 600 new weekly and monthly newspapers of which 185 are already in production. When these papers are running, they will consume 720 tons of paper annually. A long debate has been held in Parliament on the subject of newsprint supplies during which the Government was asked by one member what steps they were taking to preserve faith with the people of Canada. In the course of the debate it was disclosed that the current percentage figures of consumption in comparison with prewar was United States 137, Canada 142, South Africa 174, Australia 116, Russia 115, Germany 72, Italy 93, Belgium 85, Denmark 87, France 62, and Great Britain 28. It was further stated that "the total newsprint supply asked for by the newspapers from Canada and Newfoundland in 1949 would absorb only about £2½ million worth of dollars. We are now importing £2 million worth of American periodicals and books and spending £4½ million on American films." Finally the president of the Board of Trade held out the assurance that there would be no further cuts in supplies and mentioned that a 25 per cent increase is the Government's objective for next year.

That the present unsatisfactory position is recognized not only by newspapers and other newsprint consumers, but also by the workers in the industry, is shown by a recent memorandum submitted to the Board of Trade by the Secretary of the National Union of Printing, Bookbinding and Paper Workers. This memorandum was supported by two other workers unions. Besides pointing out that many of the largest and most up-to-date machines in the country were closed down while others were faced with short working time, it referred to the fact that the country continued to import paper. During 1947 nearly half million tons costing approximately £17¾ million were imported together with over £27½ million worth of materials (1,064,808 tons). It was suggested that if the amount spent on foreign paper had been expended on materials, this would have produced another 830,000 tons of paper.

Despite the recent endeavor to hold prices, it has been found necessary to issue a revised Paper Price Order. This however applies to but a few grades, but in view of the constantly increasing costs of imported raw materials, it would seem that other grades would have to follow shortly. Mechanical printing papers have been increased from 7/6 to £1 per ton according to the ratio of pure to mechanical fiber content of the paper. Among other papers slightly affected are pure kraft and sack kraft, cop tube papers, pure kraft liner and fluting and M.G. sulphites, caps and tissues. The latter papers have been upgraded by £3 per ton and if taken in sheets the extra is now £2-10-0 per ton against the previous addition of £1-5-0.

▼

GEORGIA PAPER COMPANIES BACK 4-H FORESTRY CAMP

Sponsored by the Union Bag and Paper Corporation and the Brunswick Pulp and Paper Corporation, Georgia's fourth annual State 4-H Club Forestry Camp held during the first week of June attracted more than 100 county agents and 4-H Club boys.

Speakers for the week included Dr. Harry L. Brown, vice chancellor of the University System of Georgia; George H. King, director of the Coastal Plain Experiment Station of Tifton; A. R. Shirley, state forester at Atlanta; J. J. Armstrong, of the Union Bag and Paper Corporation; and S. N. Cooper, of Brunswick Pulp and Paper Corporation.

▼

▶▶▶ THIRTEEN EMPLOYEES of the National Gypsum Company who have completed 20 years of service received watches at the company's annual picnic in June given at the Automobile Club of Buffalo. Presentations were made by President Melvin H. Baker, who said that the company now has 23 plants and 6000 employees.

▼

▶▶▶ THE PULP DIVISION of the Weyerhaeuser Timber Company is moving offices from Longview, Washington, to Tacoma, Washington, where the Weyerhaeuser firm has its main Northwest offices. Howard Morgan is manager of the pulp division.

▼

▶▶▶ A NEW LINERLESS carton for the factory packaging of ice cream has been put out by the Container Corporation of America. They are made in gallon and half-gallon sizes from heavy paperboard in a special one-piece construction to stand up square and rigid without distortion in the automatic filling operation. Both sizes are proportioned to fit standard size cabinets and for storage in combination with each other, saving approximately one-third of the space needed for round containers.

▼

▶▶▶ CONSTRUCTION OF a 50,000 square foot addition is under way at the plant of Stone Container Corporation, Chicago. The engineer architect is A. Epstein & Sons.

▼

▶▶▶ THE NEW CORRUGATED container plant at Flint, Michigan, is being expanded by the Ottawa River Paper Company, Toledo, Ohio. The capacity of the plant will be greatly enlarged and new machinery added, according to President Philip LeBoutillier, Jr., in order to facilitate better service and take care of increased demands in the Michigan area.

▼

MUNISING PREPARES FOR CANADIAN PULPWOOD RAFT

Booms have been set in position in the bay opposite the Munising Paper Company (Munising, Mich.) in preparation for delivery this month of a raft of pulpwood to be towed there from Nipigon straits across Lake Superior.

The raft will contain about 8,000 cords of spruce and balsam pulpwood. This is the first raft of Canadian pulpwood to be brought to Munising in two years and will be the only one to be delivered this year. Formerly the paper company purchased approximately 25,000 cords of pulpwood from Canadian sources each season, but the supply of timber has gradually dwindled and the remaining supplies have become so inaccessible, with the corresponding higher logging costs, that this type of timber is increasingly difficult to obtain.

▼

▶▶▶ FIRST SALES CONFERENCE to be held by the National Gypsum Company since before the war was attended by executives and managers of its fifteen district sales offices on June 10-12 in Buffalo, New York. President Melvin H. Baker welcomed the managers, and Dean D. Crandell, vice president in charge of dealer sales, presided.

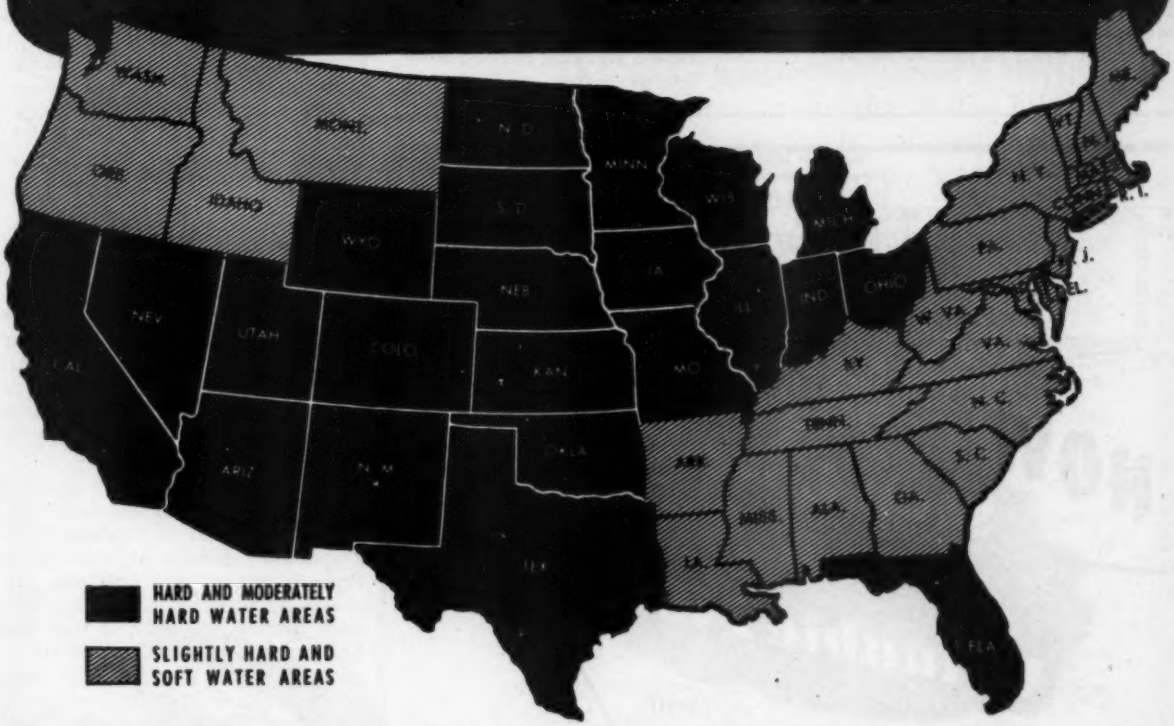
▼

UNION BAG CORP. AWARDS 2 FORESTRY FELLOWSHIPS

Two Union Bag & Paper Corporation fellowships have been awarded for next year to W. N. Haynes and Richard C. Smith. These fellowships are awarded annually to worthy students who are interested in industrial fores-

Announcing NOPCO KFH

for Hardwater Areas



Where does your mill fit into this picture? If it is located in any of the hard or moderately hard water areas shown on this map, then NOPCO KFH — new *hard-water* version of NOPCO KF — can definitely help you to solve some of the tougher problems of paper production. From Nopco KFH you'll get the same unsurpassed foam-killing effectiveness that has long distinguished Nopco KF in paper mills throughout the world. As an *important plus,* you'll also find Nopco KFH *more readily dispersible,* resulting in easier, speedier preparation of stock emulsions.

The same quick action, dependability and economy. Like NOPCO KF, NOPCO KFH needs but minutes to drive foam from the head-box, clear bubbles from the wire. Like KF, KFH improves sheet formation even at increased machine speeds, with better than 75% elimination of thin spots. What's more, Nopco KFH is proving as effective as Nopco KF in providing these advantages to mills in *soft-water areas.* For this reason—and because of its *greater ease of handling*—mill operators in soft-water regions will find Nopco KFH well worth investigating.

NOPCO KFH, in short, is another outstanding product added to an already versatile and successful line of NOPCO products — all acknowledged leaders in their field. NOPCO KFH is a further example of Nopco's continuing program of research, whose aim is to provide the Paper Industry with the most advanced developments in processing chemicals.

See what this *new chemical substance* — expressly formulated to aid sheet formation and eliminate foam in hard-water areas — can do in *your* mill. Why not include a barrel or two of NOPCO KFH in your next order for regular NOPCO KF?

NOPCO CHEMICAL COMPANY, Harrison, N. J.
formerly National Oil Products Company
Branches: Boston • Chicago • Cedartown, Ga. • Richmond, Calif.

FOR KF PERFORMANCE IN HARD WATER

*REG. U.S. PAT. OFF.

NOPCO KFH

NOPCO
EVOLVED THRU RESEARCH

An Affiliate of the American Pulp and Paper Mill Superintendents Association

try, for one year of graduate work in forestry at Duke University School of Forestry. Each carries a stipend of $800, and a fund for expenses in connection with the recipient's thesis projects. The company also provides two scholarships annually for four years of undergraduate study in forestry at the University of Georgia.

Mr. Haynes is a forestry graduate of the University of Georgia while Mr. Smith is a graduate of the University of Minnesota and also of the Duke School of Forestry where he received the M.F. degree in 1947.

PATENT OFFICE SWAMPED WITH NEW APPLICATIONS

Many war and postwar developments are being kept out of use because of the inability of the U. S. Patent Office to cope with the mounting flood of patent applications, which has almost doubled in the past four years, says H. A. Toulmin, Jr., nationally-known patent attorney, in a 32-page article on "Patents and the Engineer," the first half of which is a special insert in the June issue of *Product Engineering*.

Applications are being received at an annual rate of 70,000, nearly double the 1943 rate. Loss of examiners who are experienced in special fields and an increasing complexity of cases, which make simple examinations impossible, are two of the reasons cited by Toulmin for the fact that today 150,000 cases await action and the examination of applications lags two years behind schedule.

▼

▶▶▶ A SLIDE-SHOW, "The Manufacture of Coated Book Papers," has just been completed by the Watervliet Paper Company (Watervliet, Mich.). Showings of the 75 color slides, which include photomicrographs of book fiber beaters, jordans, and mill flow diagrams, are being offered to graphic arts trade organizations in the midwest.

▼

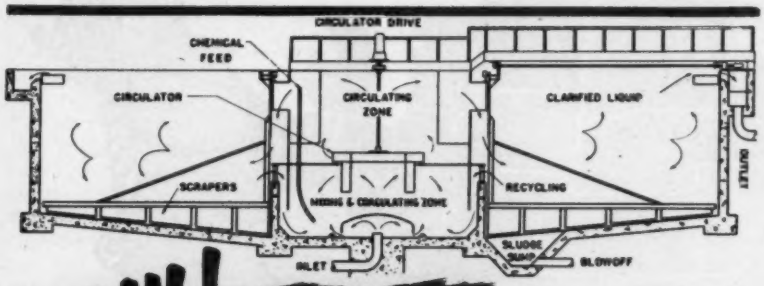
FT. WAYNE PAPER CO. WILL CLOSE JUTE OPERATIONS AT HARTFORD CITY, INDIANA

The closing of its jute paperboard operation at Hartford City, Indiana, has been announced by the Fort Wayne Corrugated Paper Company. The mill was operated as an emergency supply source since February, 1943.

The mill was owned and operated by Fort Wayne Corrugated until 1938, when it was sold to Southern Kraft Corporation, division of International Paper Company. The mill was purchased by Southern Kraft for retirement because linerboard at that time had largely supplanted jute. With the start of World War II, kraft linerboard became a decidedly scarce material. Fort Wayne Corrugated, faced with the possibility of closing its own plants, leased the abandoned Hartford City jute mill from Southern Kraft in February, 1943, under an agreement to divide production between the two operators.

Paperboard vital to the war and postwar economy for a total of 216,423 tons was produced by the mill during its emergency operation, and placed about $2,000,000 in payroll money in Hartford City, company officials said. Severance pay of six months was given employees of the closed plant, based on annual pay and graduated by length of service periods starting at six months to a maximum of five years.

The critical shortage of paperboard has been eased by the establishment of new kraft paperboard mills in Wentworth, Georgia, jointly owned by Fort Wayne Corrugated and Robert Gair, Inc. The company expects to obtain the major part of its kraft linerboard requirements from this mill for its four converting plants at Hartford City, Chicago, Pittsburgh, and Rochester (New York), according to H. M. Treen, president of the company.



NOW! Stop Loss of Valuable Fibre with CYCLATOR®

NEW and BETTER
WHITE WATER TREATMENT
EXCLUSIVE INFILCO PROCESS

OUTSTANDING RESULTS NOW BEING OBTAINED in treatment of board mill white water

- Effluent contains only ¼# per 1000 gallons —95% suspended solids removed
- 50% (5-day) B.O.D. Reduction
- Stock of 1% consistency recovered for re-use

Let us tell you how you may enjoy the same benefits

INFILCO — Water Conditioning and Waste Treating Equipment

Write or call nearest Office or Headquarters Chicago

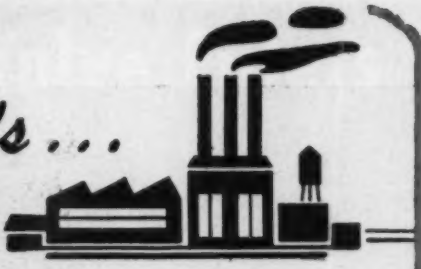
Atlanta, Baton Rouge, Boston, Buffalo, Cleveland, Denver, Detroit, El Paso, Houston, Indianapolis, Los Angeles, Minneapolis, New York City, Omaha, Orlando, Fla., Pittsburgh, Philadelphia, St. Louis, San Diego, San Francisco, Seattle, Tulsa

FIRST for Over FIFTY YEARS

INFILCO INC • 325 WEST 25TH PLACE • CHICAGO 16, ILLINOIS

For cost-wise mills . . .

STOCK LINES of MONEL



MORE than 15 years of trouble-free service! That is what one mill reports of MONEL* stock lines used for carrying alkaline bleached sulfite pulp. Scores of other mills report similar experiences with MONEL pulp-handling equipment.

What *special* properties of MONEL make such remarkable service records possible? There are many. It will pay you to consider them carefully!

MONEL is 100% rustproof, and highly resistant to corrosion and chemical attack. These features, alone, will put an end to your stock-line deterioration worries.

Add to the list, satin-smooth finish, strength equal to structural steel . . . *and you have a metal "made-to-order" for pulp, paper, and board mill uses.*

You'll find MONEL easy to work with, too. You can weld, braze, and solder it . . . perform any standard fabricating operation without special tools.

Important, too . . . because of MONEL's exceptional strength, you can use lighter sections for stock lines. Van Stone or other readily-connected joints will make it easy for you to remove or redesign your installations.

Your nearest INCO distributor stocks easily-workable "35" MONEL sheet. Or, if you prefer not to do your own fabricating, he will recommend competent concerns specializing in this work.

You'll find a list of distributors in: *"Lighter Weight, Longer Life, Lower Cost Stock Lines."* Send for your copy today.

*Reg. U. S. Pat. Off.

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.

MONEL . . . for Minimum Maintenance

THIS PAPER COMPANY'S CHEMICAL SUPPLIER

Recommended

INCONEL-CLAD STEEL

Water-soluble phenol formaldehyde resin is handled by these tanks.

Riegel Paper Corporation of Milford, New Jersey, makers of rope, jute and glassine papers, asked the manufacturers from whom their chemicals came what material they'd suggest for these tanks. Lukens Inconel-Clad Steel was recommended and used.

The need for safeguarding these chemicals was recognized by their manufacturers and user alike. Inconel provided that protection. Lukens Inconel-Clad Steel reduced the cost of these tanks.

If your products or equipment require the protection provided by nickel, stainless steel, Inconel or Monel, it may pay you to consider using clad steels. In Lukens Nickel-Clad, Stainless-Clad, Inconel-Clad and Monel-Clad Steels, a uniform cladding of the corrosion-resistant metal is permanently bonded to a steel backing plate. Thus you get *solid* metal protection with *clad* steel economy.

Lukens offers the widest selection of clad steels available from any source—thicknesses of 3/16" and over, and as wide as 178". Claddings of 10% or 20% of total plate thickness suit most uses. For Bulletins 255 and 338, write Lukens Steel Company, 408 Lukens Building, Coatesville, Pennsylvania.

CLAD METAL STEEL

LUKENS

Nickel-Clad Stainless-Clad
Inconel-Clad Monel-Clad
STEELS

SOLID METAL ADVANTAGES WITH CLAD STEEL ECONOMY

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

OLIVER Ringvalve Filters at Brown Company

3 RINGVALVES handle the KRAFT WASHING

2 RINGVALVES handle the THICKENING

...in the NEW 200 Ton SULPHATE MILL of Brown Company

● Brown Company recently started operations in the large mill at Berlin, N. H. which it had converted from sulphite to sulphate. Oliver Ringvalve Filters were installed to handle the brown stock washing and thickening jobs. Handling the 200 tons per day design tonnage, these filters are easily capable of handling up to 250 tons.

The Ringvalve Washers, shown in the picture, are washing counter-currently as a three stage system. The exceptionally high hydraulic capacity of the Ringvalves permits operations with more dilute feed in the vat thus promoting more uniform and better sheet formation which, in turn, results in better washing.

Brown at Berlin is the latest of the new mills to break into production with Oliver Ringvalves. Many are now in service and are making excellent records.

OLIVER UNITED FILTERS INC.

New York 18, N. Y.
33 West 42nd Street

San Francisco 11,
California

Chicago 1, Ill.
221 N. LaSalle Street

Western Sales Division
Oakland 1, California
2900 Glascock Street

Sales and Manufacturing Representative:
E. Long Limited
Orillia, Canada

Factories: Oakland, Calif. • Hazleton, Pa. • Orillia, Canada • Melbourne, Australia

In Stock... for immediate delivery

The largest and most complete line of ALLOY VALVES

Globe, Gate, Check and "Y" Valves and Liquid Level Gauges made in Stainless Alloys, Nickel, Inconel, Monel Metal and Aluminum—the result of a quarter of a century of pioneering in the field of Special Designs and Special Alloys for Corrosion Resistance.

Also a complete line of Bronze, Iron, and Cast Steel Valves in stock for immediate delivery.

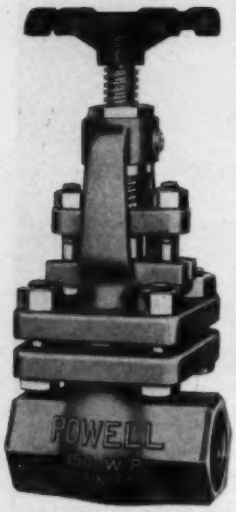


Fig. 1978—Stainless Steel Globe Valve with screwed ends, bolted flanged yoke-bonnet and outside screw rising stem.

Fig. 1896—Stainless Steel Liquid Level Gauge with screwed ends. Powell offset pattern.

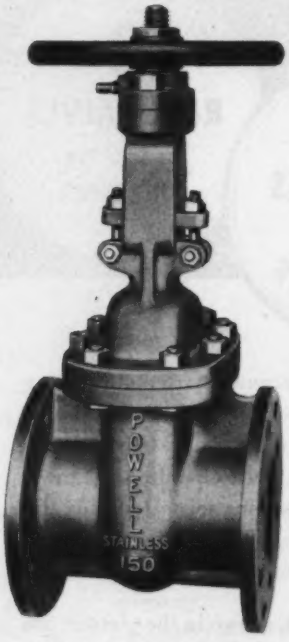


Fig. 2453-G—Stainless Steel Gate Valve with flanged ends, bolted flanged yoke-bonnet and outside screw rising stem.

Fig. 1893—Flanged end Gate Valve designed and developed especially for Paper Mill service. Body, bonnet and yoke are cast of 3% Nickel Iron; screwed-in seat rings are of 18-8 SMo; solid wedge is made of Ni-resist.

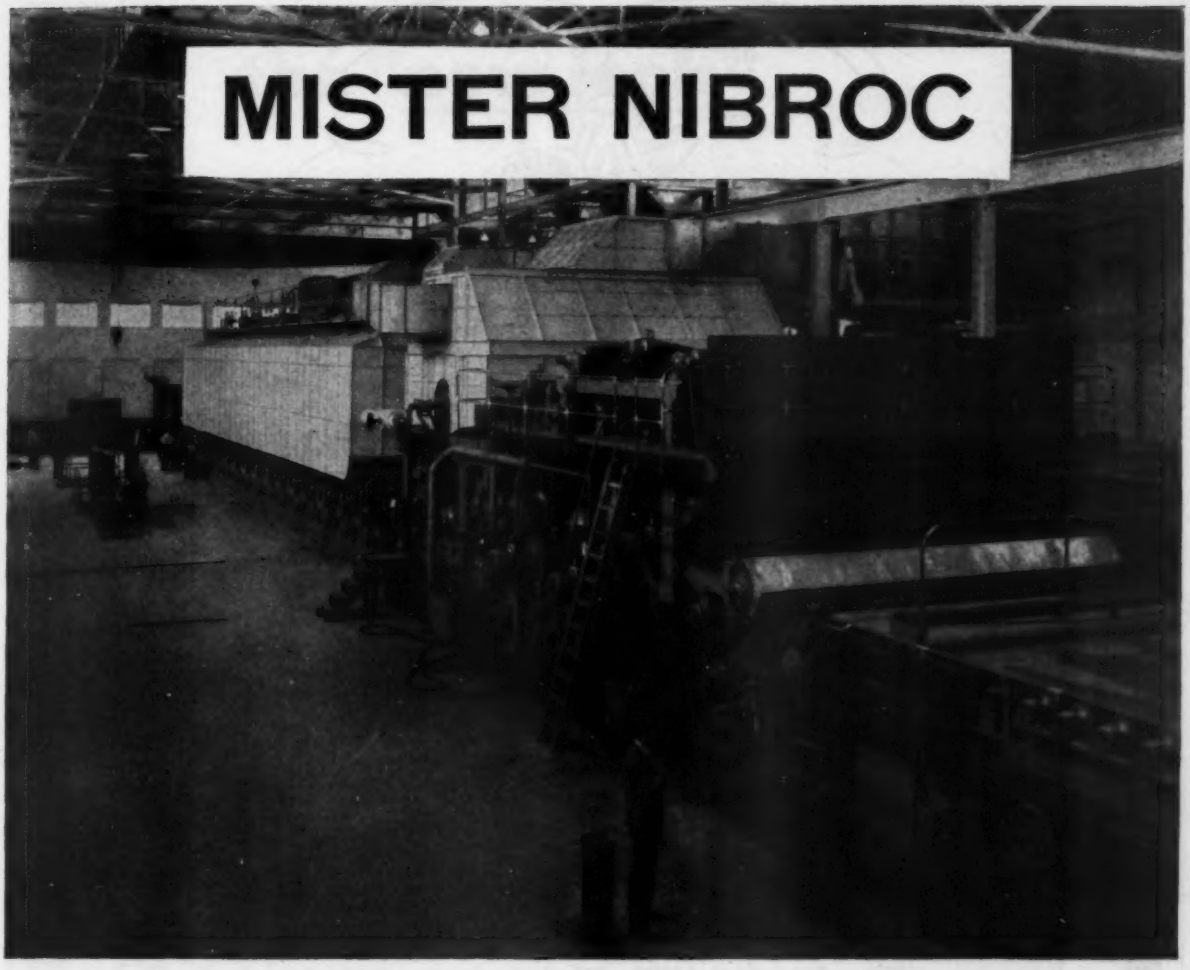
Fig. 2051—Stainless Steel "Y" Valve with flanged ends, bolted flanged yoke-bonnet and outside screw rising stem.

If you do not have a copy of the Powell Alloy Valve Catalog No. 242—"Powell Valves for Corrosion Resistance"—write for one.

The Wm. Powell Co., Cincinnati 22, Ohio

DISTRIBUTORS AND STOCKS IN ALL PRINCIPAL CITIES

POWELL VALVES



WE ARE PROUD to have collaborated with the Brown Company in carrying out their program of expansion. The new paper machine "MISTER NIBROC" at Berlin, New Hampshire is a Rice-Barton product from Fourdrinier to Winder.

Against a background of over a century of paper machine design every detail has been studied and the result is a paper machine tailored precisely to fit the Brown Company's requirements.

RICE BARTON CORPORATION

WORCESTER, MASSACHUSETTS

WEST COAST REPRESENTATIVE

RAY SMYTHE, 501 PARK BUILDING, PORTLAND, OREGON

SYMBOL OF EXCELLENCE

Throughout the world the Anheuser-Busch trademark is recognized and accepted as a symbol of excellence. Any product which bears the famous "A" and Eagle may be purchased with complete confidence in its quality and performance under the most exacting conditions. Our sales and technical staff is available to discuss any problem with you involving the use of Starches or Dextrines in regular or special formulas to meet your requirements.

- STARCHES
- DEXTRINES
- GUMS
- CORN SYRUP

CORN PRODUCTS
DIVISION

ANHEUSER-BUSCH, INC.

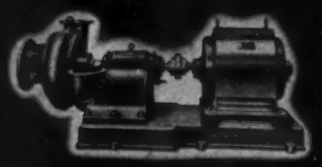
ST. LOUIS, MO.

the "new look"

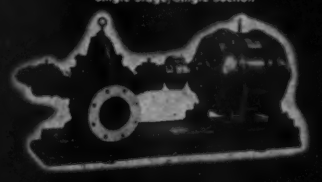
Brown Company's
New Kraft Mill, Berlin, N. H.

Warren Stock Pump
Type 2-SOD-11 and 3-SOD-11

Warren Stock Pump
Type 5-SOD-15 . . . 12" suction nozzle



Warren Liquor Pump, Type "L"
Single Stage, Single Suction



Warren Double-Suction Pump
Single Stage

. . . and in this case the "New Look" is a look to the future . . . typical of the progressive policy of the Brown Company, which includes their selection of

WARREN PUMPS

for many important services where long life, low maintenance, low operating costs and maintained efficiency are vital factors in uninterrupted, high quality production.

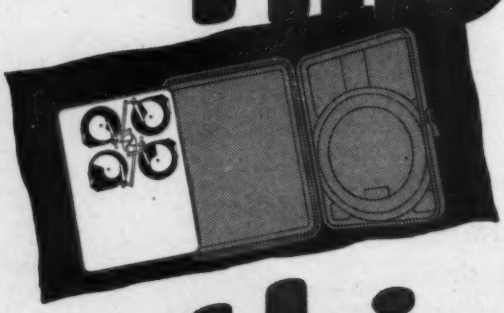
It will pay you, too, to specify "Warren" for all Pulp and Paper Mill services.

WARREN STEAM PUMP COMPANY, INC.
Warren, Massachusetts

PP-10

WARREN PUMPS

you can have this



...or this

or 100,000 other instrument combinations
. . . with 4 circuits . . . 8 basic parts . . .

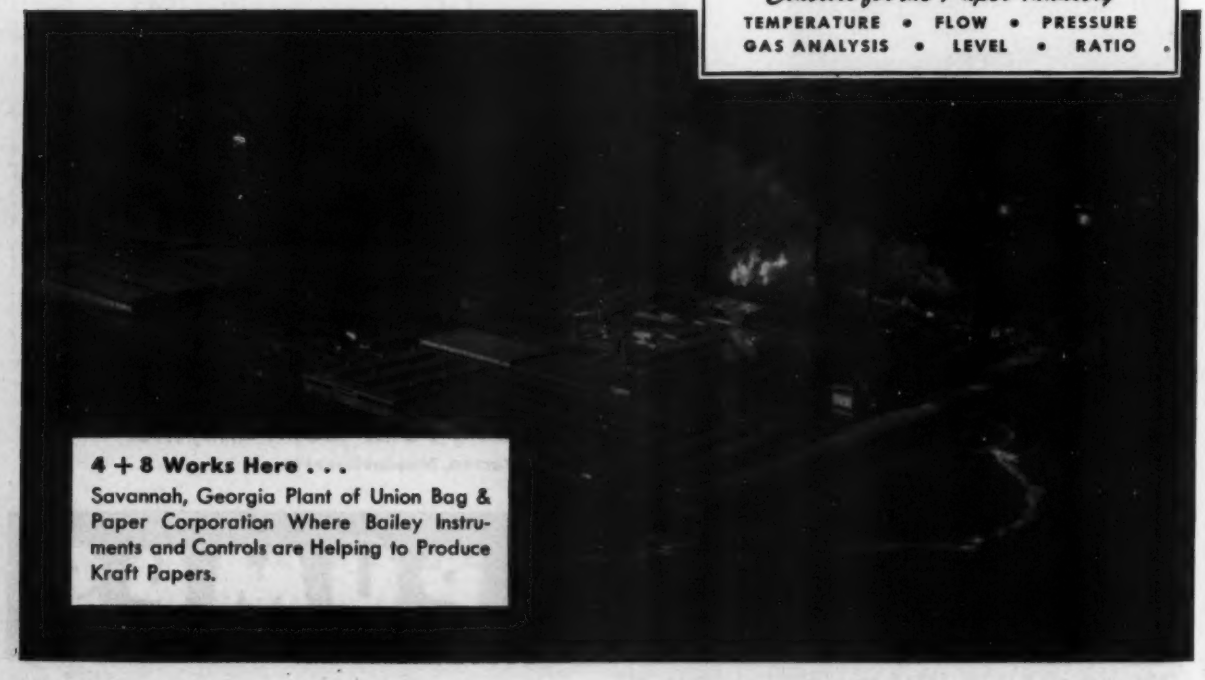
P-18-P

More than 100,000 different instrument combinations are now possible from four basic circuits and eight basic component parts. That's how Bailey has simplified electronic controls for processing industries.

No matter what your process may be, you can use Bailey controls for flow, temperature, pressure, level, speed, gas analysis, pH, conductivity, etc. Four circuits and eight basic parts are all you need. You don't have to carry a large stock of replacement parts. Bailey parts are interchangeable. The units you use for one control can quickly be adapted to another.

To learn how Bailey controls can save you money and speed up control installations, write for a copy of Bailey Bulletin No. 17.

BAILEY METER COMPANY
1058 Ivanhoe Rd. • Cleveland 10, Ohio
BAILEY METER CO. LIMITED, MONTREAL
Controls for the Paper Industry
TEMPERATURE • FLOW • PRESSURE
GAS ANALYSIS • LEVEL • RATIO



4 + 8 Works Here . . .
Savannah, Georgia Plant of Union Bag & Paper Corporation Where Bailey Instruments and Controls are Helping to Produce Kraft Papers.

Production of Paper Overtaking Capacity Limits

▶▶▶ THE OPERATIONS OF the paper industry for the first six months of the year are on record. The final revised figures for production in the last two weeks of June are not at hand at this writing, but the six months rate of production, if continued to the close of the year, should result in approximately 22,000,000 tons of paper products and board.

The volume of demand continues and will probably increase in the next six months. The race is on between production and capacity—as fast as any new capacity is installed, an overplus demand awaits it.

At the end of 1947, production closed in on machine capacity by the narrowest margin on record. In 1945, the spread between capacity and production was 2,172,000 tons, a ratio of 89 per cent; in 1947, the spread was only 746,000 tons, a ratio of 97 per cent.

It is, therefore, obvious that in order to increase production, there must be a larger increase in machine capacity, for it will be seen at the end of this year that the industry just cannot maintain a yearly production ratio of 97 per cent. So, if 1948 should show 23,000,000 tons of capacity, we doubt if production will reach 22,000,000 tons.

There are a number of restraints to supercapacity operations in the future. One is that for eight long years, the mills of the industry have operated on forced draught. To continue such operations means that many of them may blow their tops. Shutdowns for vital repairs are imperative; boilers, digesters, machine parts and entire machines need overhauling and replacement; which a 97 per cent operations does not permit.

Another restraint is the high costs and scarcities of construction materials and equipment, and the consequent delays in delivery of same. Many contemplated new units have been abandoned. Some new capacity tonnage, projected in 1945, has not yet been completed.

Then, there is the dismantling of obsolete mills which is beginning to appear. There are many such obsolete mills that would have been scrapped except for the fact that the abnormal scarcity of paper gave them an added lease of profitable life. They have been running on borrowed time, and their time is rapidly running out. These scrappings of obsolete mills will make for a considerable reduction of machine capacity.

Then, prices of paper are going higher because the costs of labor and all materials have gone up. This will be a factor to hasten the dismantling of obsolete mills because the markup in prices will come on papers made from virgin pulps of good quality as against papers carrying excessive amounts of other fibers, predominantly "old papers."

Paper prices are high though not relatively as high, as the average of other commodities. The integrated mills can get their markups because their qualities are sustained by basic virgin pulps.

The next six months operation in the industry are going to be interesting. The trend on volume and prices is unmistakably upward.

Paper, like steel, is approaching its capacity limits. The increased consumers, making for the continued upward trend of demand, are requiring more and more paper products.

Ghost Towns May Follow Denuded Timber Areas

▶▶▶ WHEN THE WISCONSIN State Conservation Commission and representatives of the paper and lumber industries met recently, the seriousness of the pulpwood situation was cited by one speaker who termed the situation "desperate."

One of the most picturesque and at the same time disheartening sights in those states which once made up our western frontier is that of a ghost town.

The alarming fact, though, is that ghost towns are not simply gaunt souvenirs of our American past. The threat of them is increasing at an alarming rate because of too great an adherence to the rule of "get while the getting's good." In many states the manufacture of pulp and paper is one of the most important industries, and the general welfare of a great number of people depend to a large extent on the conservation of land and timber.

The probability of the Wisconsin River Valley becoming a region of ghost towns was brought up at the Wisconsin meeting. The paper industry in Wisconsin requires yearly 1,500,000 cords of pulpwood, and the state is unable to supply all of it. Consequently, if Canada prohibits the export of pulpwood—and this is being considered—the paper industry in Wisconsin would be forced to cut operations. It was stated that nursery production dropped from 40,000,000 trees before the war to 8,000,000 last year, but one speaker estimated that because of increased demand production should reach as high as 50,000,000 within the next two years and 80,000,000 in the next ten years.

A study committee was set up at the meeting to determine methods of averting the threatening timber shortage, and a proposed field of work included: an enlarged fire protection area, an expansion of the nursery program, reforestation work on private property, public education on the need for selective cutting and reforestation, and increased research on pests.

The suggestion was made that there should be legislation to limit tree cutting and to preserve selective cutting, for at present the cutting of young trees is destroying the state's forests. A bill to regulate wood cutting was introduced in the 1947 state legislature, but failed of passage.

Conservation of our rapidly dwindling timber supplies is perhaps the first interest of the paper and pulp industry, and it is encouraging to know that papermaking states through their conservation commissions and industrial paper companies are looking toward a solution of their own problems. Such state programs co-ordinating with the several national groups organized specifically to guard our trees will "Keep America Green."

BETWEEN THE LINES

Our Quest for Happiness . . .

▸▸▸ THE STORY OF one hundred and seventy-two years of freedom has been written into the history of the United States since the Declaration of Independence was signed. Although 126 other historical documents have been displayed on the Freedom Train now touring the nation, the most familiarly known and revered of them all is the Declaration of Independence. This historical document is undisputably recognized as the nation's passport to unceasing and everlasting liberty.

Among the thousands of Americans who have waited in long lines for a brief glimpse of these immortal laws of liberty, probably few could recite from memory more than bits of the text. But those top phrases, indelibly fixed in the minds of most citizens, are unalterable, and it is unthinkable that even a selfish and personally ambitious leader would ever come forward and so much as hint they could be changed or modernized.

One of the most oft-quoted declarations accorded to men in this memorable classic is "the pursuit of happiness." Thomas Jefferson, in whose handwriting the original document is recorded, and the other representatives of the thirteen colonies who signed it, drew deep from the sea of human understanding when they inserted this, the greatest quest of civilization into the cornerstone of a new nation of free men.

Oddly enough, the evolution of civilization has been symbolized in art and prose by man, the hunter. Times haven't changed much except that the veneer of civilization has become a bit thicker. For every child born in this old world, be it in the Americas, Europe, Asia, or any of the lands beyond the sea, begins a journey which will take him on a life search for "happiness." The wonderful thing about happiness is that we don't all look for or find it in the same places or things.

Events are moving so fast nowadays that the old cry of revelry "Off with the Old! On with the New!" may soon cease to mean that a new year is being born.

Some housewives are feeling a mingled relief and regret over changes they are enjoying and more yet to come. Even the best of small neighborhood stores, and all of the large ones, have well-stocked deep freeze cabinets. Brides no longer need to learn how to cook—they even put up instant potatoes now; she doesn't have to know how to mash them—and some of the husbands like it that way for they eat better than if the darlings tried to cook.

At this rate, their grandchildren won't have to worry about going to the store "to get daddy's supper." By then, man may have had his appetite so frozen that he will just go into his vest pocket at noon for a lunch tablet and keep on working.

In its *Industrial Bulletin* for May, Arthur D. Little Inc., carries an article describing the operation of the "taste panel" used by many big food and coffee and tea companies. Tasters, you know, are a group of research individuals employed to measure the public's taste, to pass on the products offered for sale and to bring the standards of those products up to popular demand. It is stated, however, that the techniques for evaluating flavor through its components, taste and odor are as yet in the embryonic stage.

The *Bulletin* makes this interesting statement about odors: "The assumption is that odors are sensations produced through absorption by the odor-exciting substances of the infrared rays emitted by the smelling area in the nose. If proved correct and usable, it opens up some attractive long-range possibilities for odor detection or recording with instruments. Early work on this subject was carried on some seventy years ago, but has subsequently been ignored or forgotten. Currently, and probably for the immediate future, reliance is being placed on methods utilizing the human senses, and these methods are steadily being improved."

There are some signs of the times that may mean a shifting of job trends. One of these is a special kind of new comb, now being advertised, which, with a little practice, is said to trim a man's hair about as well as the barber can do it. There is a razor-like edge inserted in the comb which does the trick. Milady also may take off some straggly ends before getting a new permanent. With the price of a hair cut, barbers may find business dropping off and decide it will be more profitable to manufacture combs!

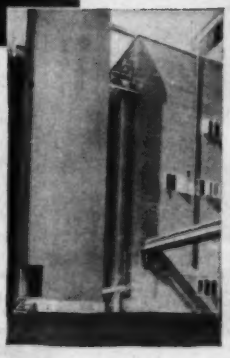
Another sensational discovery may put some florists out of business. A chemical formula recently developed will keep flowers fresh indefinitely. The origin of this discovery is related in *The Nepco Digester* (published by Nekoosa-Edwards Paper Company) under the title "Oddity of an Accident." The *accident* occurred when a chemist experimented with a solution to prevent paper from aging. Angered because it didn't work, he threw a rose into the solution. A week later, the rose was there, as fresh as when first cut. But, sad to relate, every accident has its casualty. In this case, the rose had lost its fragrance. Which leaves one to speculate on what comes next—a new discovery that will preserve both the rose and its sweetness, or an increase in the manufacture of rose scent.

—By Bessemer

LINK-BELT

Conveyors Handle Chips and Salt Cake for New Kraft Mill at Brown Company

Link-Belt horizontal and inclined belt conveyor carrying chips from storage building to kraft mill housing digestors.



L-B screw conveyor draws salt cake from bin, which is raised by L-B bucket elevator to top of building where a second L-B screw conveyor takes it to processing system.

Smooth, efficient handling which is a large factor in profitable operation, is exemplified at Brown Company's new Berlin, N. H. Kraft Mill, by the Link-Belt conveying machinery shown here. Wood chips are fed from bins to belt conveyors by Link-Belt rotary feeders, driven by Link-Belt Silverlink roller chain drives. Link-Belt troughing idlers with outer rolls at 45 degrees provide high carrying capacity. The 36 in. belt, at 400 ft. per min. carries 15,240 cu. feet of chips per hour.

The view above, showing hard wood chip bin, 15 feeders and belt conveyor, is duplicated for soft wood chips storage bin.

L-B screw conveyors and a bucket elevator, carry salt cake from storage to processing.

LINK-BELT COMPANY

Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8.
Offices, Factory Branch Stores and Distributors in Principal Cities. 11,182

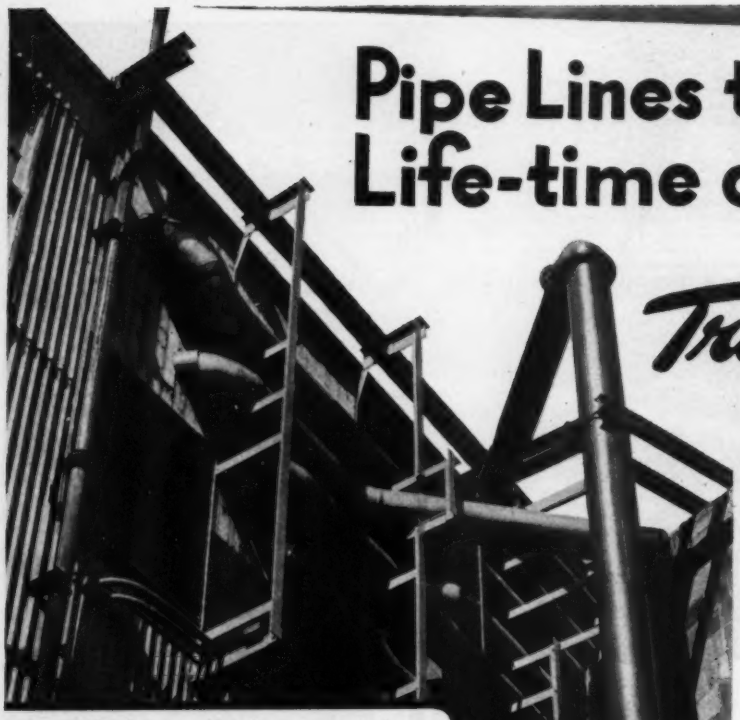
LINK-BELT

CONVEYING MACHINERY

Pipe Lines to Pace The Life-time of The Mill

from

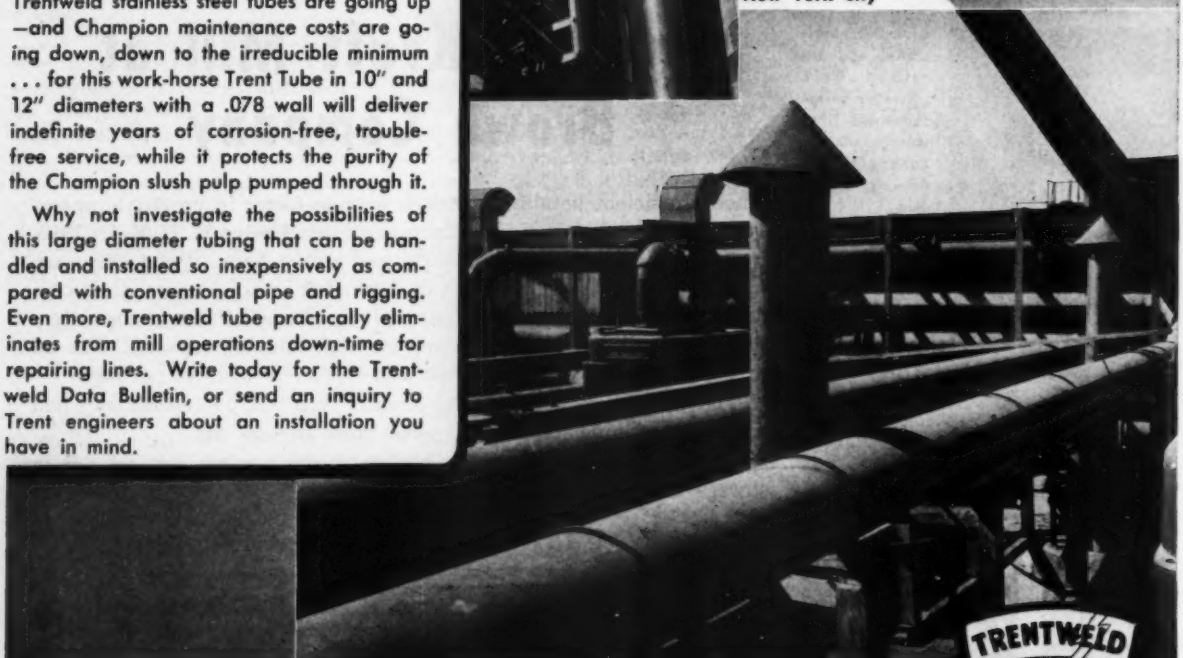
Trentweld Large Diameter Stainless Steel Tubes



A quick glance will tell you what's happening here — at the new Champion Paper and Fibre Company mill under construction at Pasadena, Texas. Rugged, lightweight Trentweld stainless steel tubes are going up —and Champion maintenance costs are going down, down to the irreducible minimum . . . for this work-horse Trent Tube in 10" and 12" diameters with a .078 wall will deliver indefinite years of corrosion-free, trouble-free service, while it protects the purity of the Champion slush pulp pumped through it.

Why not investigate the possibilities of this large diameter tubing that can be handled and installed so inexpensively as compared with conventional pipe and rigging. Even more, Trentweld tube practically eliminates from mill operations down-time for repairing lines. Write today for the Trentweld Data Bulletin, or send an inquiry to Trent engineers about an installation you have in mind.

Engineers — Ebasco Services Inc. New York City



District Offices—New York, Chicago

TRENT TUBE MFG. CO.

440 Church Street, East Troy, Wisconsin

SMOOTHNESS

The texture of *Wyandotte Precipitated Calcium Carbonate* is another "picture of smoothness."

This highly refined paper-coating pigment is unequaled in freedom from grit and abrasiveness . . . in hiding power and ink absorption . . . in that uniformity which is so essential to machine coating.

Its superiority is the result of Wyandotte's extensive research and long experience in the field. For years, Wyandotte has made a *business* of supplying paper manufacturers with this truly fine pigment.

Why not write today for complete information on Wyandotte Precipitated Calcium Carbonate?

WYANDOTTE CHEMICALS CORPORATION
WYANDOTTE, MICHIGAN • OFFICES IN PRINCIPAL CITIES

Soda Ash • Caustic Soda • Bicarbonate of Soda • Calcium Carbonate • Calcium Chloride • Chlorine • Hydrogen • Dry Ice • Glycols
Ethylene Dichloride • Propylene Dichloride • Chloroethers • Aromatic Sulfonic Acid Derivatives • Other Organic and Inorganic Chemicals

Wyandotte
REG. U. S. PAT. OFF.

Impco FLAT SCREENS

Here are a few pictures of a recent Impco installation at West Virginia Pulp and Paper Company's plant in North Charleston, South Carolina. Special attention is given to keeping air out of the stock thus promoting faster screening and thickening.

The new Impco Flat Screens are designed for getting the most from any bronze or stainless steel plate. Look for:

- *Rigid Cast Bronze Vats*
- *Silent adjustable, positive stroke, eccentric drive—anti-friction bearings*
- *New replaceable bevel plate fasteners*
- *Higher capacity with extra large outlets*
- *New plate-end fastenings—eliminating wood sealing strips*

Let us work with you to achieve higher capacity, finer quality.

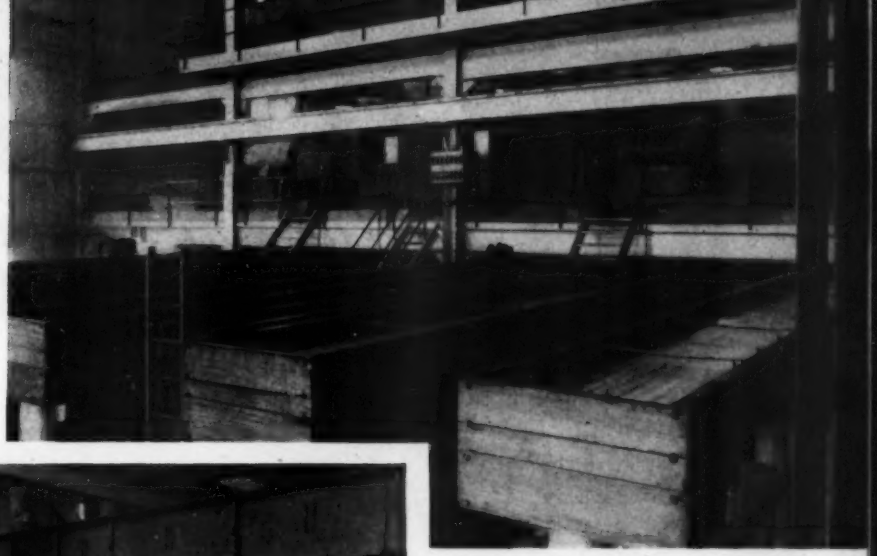
Improved Paper Machinery Corporation

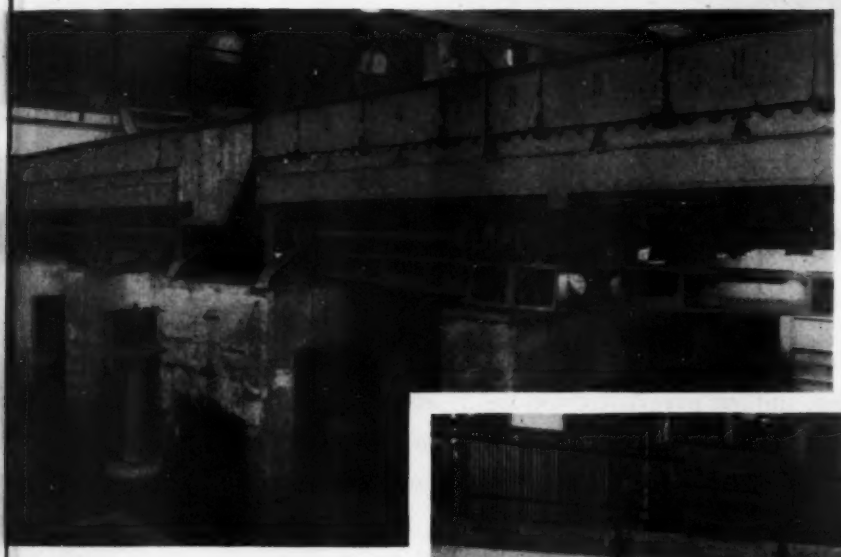
NASHUA, NEW HAMPSHIRE

A-12

⇩ *Screens and Vacuum Deckers. Piping is below floor*

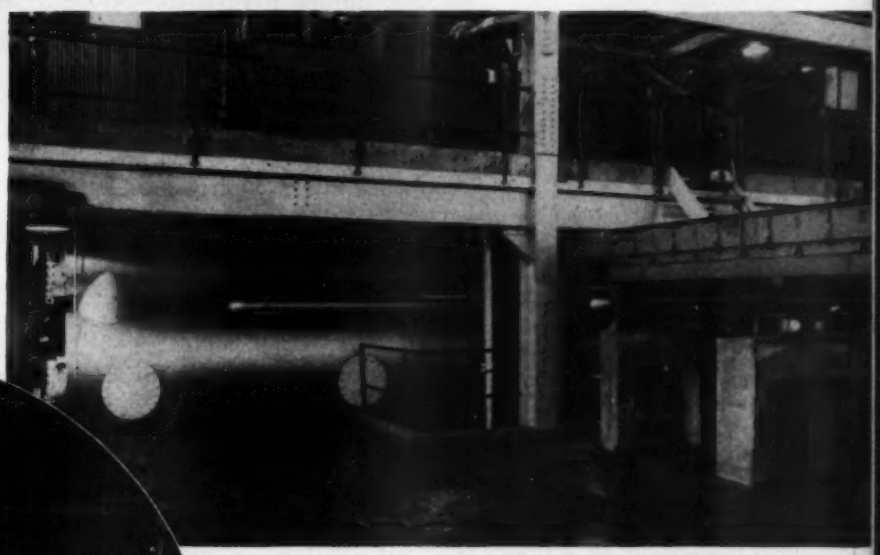
for
igher Capacity
for
iner Quality



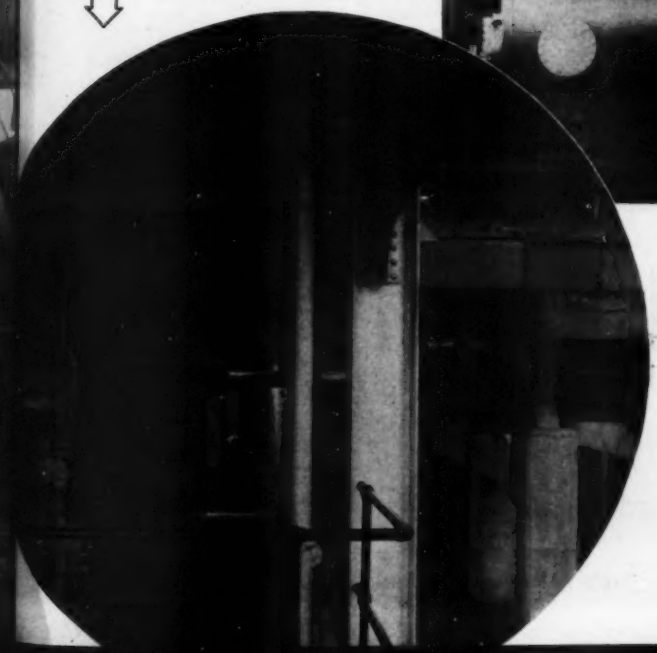


Two Stock Volume Meters with Consistency Regulators govern steady flow through Impco Knotters and Screens

Bronze Vat Screens, two per line mounted for easy maintenance



Pressure Stock Headers with Submerged Inlets and "Forming Aprons" for uniform distribution to Screens



"From Cooking to Use"

IMPCO

Pulp Mill Equipment

KELGIN *smoothes the way...*

FOR

Better Paper Surface

● Kelgin, the modern algin surface sizing agent, helps produce a smooth, uniform paperboard surface . . . assures controlled penetration of printing inks, oils and waxes. Your customers can count on maximum brilliance of high gloss inks, clean color values and extra-sharp printing results.

Easy to handle, Kelgin is soluble in both hot and cold water. It is adaptable to water box application in the calender stacks – causes no foaming, picking or sticking to the rolls.

Kelgin is a product of nature, free of impurities and rigidly processed to assure consistently uniform results. Surprisingly economical, too. Let us send you full information on its adaptability to your particular surface sizing problem.

KELGIN . . . A PRODUCT OF

KELCO COMPANY

KELGIN REFINED ALGIN PRODUCT

20 N. Wacker Drive
CHICAGO—6

31 Nassau Street
NEW YORK—5

530 W. Sixth Street
LOS ANGELES—14

Cable Address: KELCOALGIN—New York

3 SPECIFIC TYPES ... each for a definite purpose and all interchangeable

LUNKENHEIMER

150 LB. S.P. BRONZE GATE VALVES

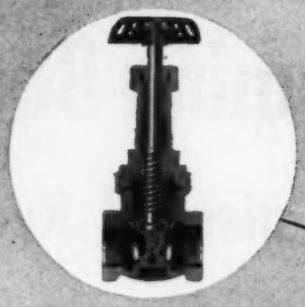


FIG. 2150
Double Wedge Disc—Rising Stem. For use where the flexibility of the double disc is needed.

FIG. 2151
Solid Wedge Disc—Rising Stem. For use where the solid disc may be an advantage, as in food processing lines and handling gummy substances.

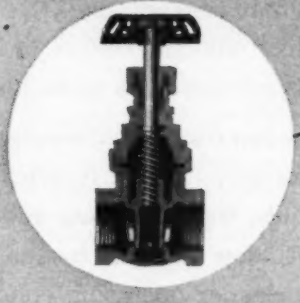
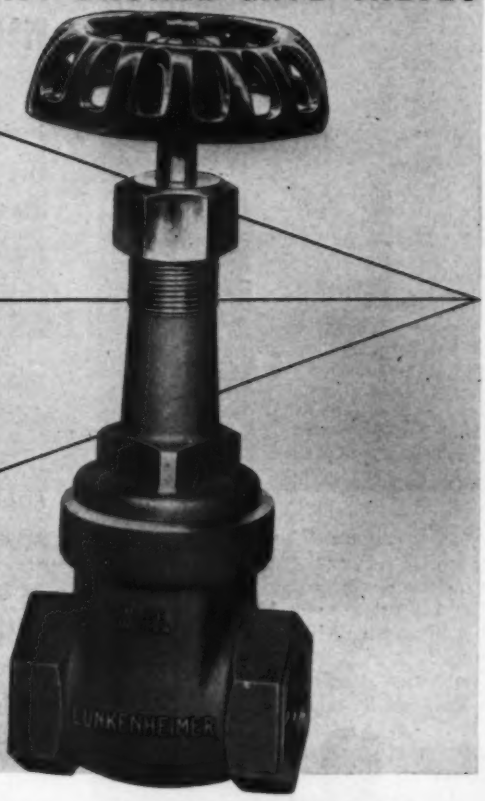


FIG. 2153
Single Wedge Disc—Non-Rising Stem. For installations where headroom is too restricted for rising stem valves.



PHONE YOUR DISTRIBUTOR FOR FOLDER

Design, construction and interchangeability are fully illustrated and described in Circular No. 574. Ask your distributor for a copy or write us direct.

● These new rugged designs meet all requirements for service where 150 lb. S.P. Bronze Gate Valves are used. They are engineered to provide a wide degree of interchangeability, making it possible to convert from one type to another by a simple interchange of trimmings. This means fewer valves and parts to stock, thus reducing maintenance expenses.

All three designs are equipped with Lunkenheimer patented wear-resistant alloy stem material which eliminates failures due to stem-thread wear.

Why not investigate the profit possibilities of these new valves in your plant—now.

ESTABLISHED 1862

THE LUNKENHEIMER CO.

"QUALITY"

CINCINNATI 14, OHIO. U. S. A.

NEW YORK 13 CHICAGO 6 BOSTON 10 PHILADELPHIA 34

EXPORT DEPT. 318-322 HUDSON ST., NEW YORK 13, N. Y.

Giant Forming Board

made from *1* piece of Ryertex

The Ryertex forming board recently delivered to a southern kraft mill is 244" long, 21" wide and 1¾" thick. Slots, cut at an angle for easier drainage, give 1610 square in. of open area.

Forming boards 244" long and 21" wide are a little out of the ordinary. But the reasons why a southern kraft producer specified Ryertex on the job shown here hold good for other paper mills, and other Ryertex applications.

Most important is the all around operating efficiency of Ryertex. Due to its extremely low coefficient of friction when water lubricated, wires slip smoothly over Ryertex with minimum wear. Because of its complete uniformity of structure, Ryertex has no hard and soft spots—will not splinter or wear unevenly like wooden boards. And the strength and toughness of Ryertex assures extra long life.

These same characteristics—low friction with water lubrication, toughness and uniformity, make Ryertex more efficient for paper mill bearings, too. On press and couch rolls, stretch and guide rolls, low friction means power savings. Water lubrication—cleaner operating conditions.

Ryertex bearings are job-proved in every step of paper making from grinders to calenders. Write today for complete information on the application in which you are interested.

JOSEPH T. RYERSON & SON, INC.

RYERTEX DIVISION: CHICAGO • NEW YORK • LOS ANGELES

RYERSON - RYERTEX

THE PAPER INDUSTRY
and PAPER WORLD
JULY 1948

Insulating Techniques at New Kraft Mill of Brown Company

A. L. SARGENT, Insulation Engineer

Burgess kraft mill of Brown Co.

▸▸▸ AS PART OF A BROAD modernization program for its Berlin (N.H.) production facilities, the Brown Company recently put into operation a new kraft pulp mill that embodies the most modern features of kraft pulp production. Located so as to become an integral section of the existing Burgess pulp mill, it utilizes the wood handling and wood preparation facilities, as well as the power, steam, and other services of that mill. The kraft mill is designed for a daily capacity of 200 tons of hardwood and softwood sulphate pulp. Rust Engineering Company, Pittsburgh, handled the detailed engineering and construction.

An important phase in the design and construction of the new mill was the insulation of the lines and equipment in order to produce and utilize steam with maximum efficiency and economy as well as to maintain desired process temperatures.

Plant Equipment

Wood chips, white liquor, black liquor, and steam are fed into four welded digesters, each 11 ft. 2 in. I.D. by 48 ft. over-all height, 3800-cu. ft. capacity, and designed for 125 psi pressure. The digesters, arranged for direct and indirect cooking, discharge into two blow tanks, each 26 ft. by 60 ft., with agitators and dilution nozzles. Flash steam from the blow tanks are sent through an accumulator and liquor heat exchanger, designed to operate at 200 Fahr. The heat obtained is used to supply hot water for washing, the hot water being kept in a 14-ft. by 33-ft. clean hot water tank. The pulp from the blow tanks is fed to three-cylinder Oliver washers and three 20-ft. by 20-ft. filtrate tanks. The first stage tank is designed to operate at 210 Fahr. and the other tanks at 175 Fahr.

Black liquor from the wash room is fed to a six-body quintuple-effect evaporator of the long tube type, heated by steam at 35 psi. The evaporator concentrates the black liquor from 15 per cent solids to 55 per cent solids for combustion in the recovery furnace and is designed to give an economy of 4.04 lb. of evaporate per pound of steam furnished.

Supplied by Combustion Engineering Company, the recovery furnace is designed for 680,000 lb. of solids in 24 hours, with steam generated at 450 psi. Hot smelt from the furnace is treated in a dissolving tank, designed to operate at 150 Fahr., and the liquor is then pumped to a 14-ft. by 24-ft. strong liquor tank that has a design temperature of 216 Fahr. The green liquor regulating tank is 14 ft. by 15 ft., and is designed to operate at 210 Fahr.

The causticizing plant is equipped with four thickeners, i.e., a white liquor clarifier, a green liquor clarifier, a lime mud washer, and a dregs washer, all with a design temperature of 210 Fahr. and ranging in size from 20 ft. by 15 ft. to 28 ft. by 15 ft.

Included in the outdoor equipment are six liquor storage tanks in sizes ranging from 18 ft. by 24 ft., to 32 ft. by 30 ft. Their design temperatures range from 150-200 Fahr.

Steam can be supplied to the new kraft mill from either an existing boiler plant or from the recovery boiler. In either case the steam is generated at 425 psi and 700 Fahr. Steam supply mains from the boiler plant and the recovery boiler are tied together at a desuperheater station where the steam pressure is reduced to 200, 125 and 35 psi, depending upon the use to which the steam is put.

In addition to the equipment already mentioned, various auxiliary equipment such as pumps, heaters, ducts, etc., are also included in the insulation specifications.

Insulating Materials

Piping and equipment operating at temperatures below 600 Fahr. are insulated with 85 per cent Magnesia

Table I—Pipe Insulation

Temp. (Fahr.)	Location	Material	Pipe Size: 5 in. and Larger	2 in. to 4 in.	1½ in. and Smaller
201-266	Indoors	85% Magnesia	Standard	Standard	Standard
267-337	"	"	1½ in.	Standard	Standard
338-387	"	"	2 in.	1½ in.	Standard
388-500	"	"	Double Standard	2 in.	1½ in.
501-600	"	"	3 in.	Double Standard	2 in.
201-266	Outdoors	85% Magnesia	1½ in.	1½ in.	1½ in.
267-337	"	"	2 in.	1½ in.	1½ in.
338-387	"	"	2½ in.	2 in.	1½ in.
388-500	"	"	Double Standard	2½ in.	2 in.
501-600	"	"	3 in.	Double Standard	Double Standard

Temp. (Fahr.)	Material	Pipe Size: Up to 1½ in.	2 in.	2½ in.	3 in.	3½ in.	4 in.	4½ in.	5 in. & Longer
601-700	Diatomaceous Silica	2 in.	1¼ in.	1¼ in.	1⅜ in.	1⅜ in.	1⅜ in.	1⅜ in.	1½ in.
	85% Magnesia	—	1½ in.	1½ in.	1½ in.	1½ in.	1½ in.	2 in.	2 in.
701-800	Diatomaceous Silica	2 in.	1¼ in.	1⅜ in.	1⅜ in.	1⅜ in.	1⅜ in.	1⅜ in.	1½ in.
	85% Magnesia	—	2 in.	2 in.	2 in.	2 in.	2 in.	2½ in.	2½ in.
801-1000	Diatomaceous Silica	2 in.	1⅜ in.	1⅜ in.	2⅛ in.	1⅜ in.	2⅛ in.	1⅜ in.	2 in.
	85% Magnesia	—	1½ in.	1½ in.	1½ in.	1½ in.	1½ in.	2 in.	2 in.

insulation, a molded material consisting of magnesium carbonate to which asbestos fiber is added for the necessary binding and reinforcing qualities.

Where operating temperatures exceed 600 Fahr., a combination insulation has been used consisting of an inner layer of diatomaceous silica, which is a high temperature insulation, and an outer layer of magnesia. Diatomaceous silica is a naturally occurring material whose structure consists of microscopic fossilized plants called diatoms. As in the case of magnesia, asbestos fiber is added in the manufacturing process for structural reinforcement. Although the physical and thermal properties of the two materials are similar, diatomaceous silica insulation is more suitable for high temperature work, while the magnesia has a lower conductivity. In combination, advantage is taken of the desirable properties of both materials.

TABLE 2—Equipment Insulation

Location	Operating Temperatures (Fahr.)	Thickness of insulation
Indoors	151 to 200	1½ in. 85% Magnesia
"	201 to 300	2 in. 85% Magnesia
"	301 to 400	2½ in. 85% Magnesia
"	401 to 500	3 in. 85% Magnesia (Two 1½-in. Layers)
"	501 to 600	3½ in. 85% Magnesia (2-in. and 1½-in. Layers)
Indoors	601 to 750	1½ in. Diatomaceous Silica and 2½ in. 85% Magnesia
"	751 to 900	2 in. Diatomaceous Silica and 2½ in. 85% Magnesia
"	901 to 1000	2½ in. Diatomaceous Silica and 2 in. 85% Magnesia
Outdoors	151 to 200	2 in. 85% Magnesia
"	201 to 300	2½ in. 85% Magnesia
"	301 to 400	3 in. 85% Magnesia (2 1½-in. Layers)
"	401 to 500	3½ in. 85% Magnesia (2-in. and 1½-in. Layers)
Outdoors	501 to 600	4 in. 85% Magnesia (Two 2-in. Layers)
"	601 to 750	1½ in. Diatomaceous Silica and 3 in. 85% Magnesia
"	751 to 900	2½ in. Diatomaceous Silica and 2½ in. 85% Magnesia
"	901 to 1000	3 in. Diatomaceous Silica and 2 in. 85% Magnesia

Insulation thicknesses used for piping and equipment are listed in Tables 1 and 2, respectively. These are the optimum thicknesses for the particular operating conditions involved. Factors such as maximum design temperatures, pipe and equipment sizes, location, desired temperature control, etc., were taken into account in drawing up the specification.

Where combination insulation has been used, the thickness of the inner diatomaceous silica layer is sufficient to lower the temperature at its surface to below 600 Fahr. and thickness of the magnesia layer is governed by the above mentioned factors.

When thickness specifications for outdoor piping and equipment were drawn up, an ambient air temperature of −10 Fahr. was taken as a design basis. In many cases, the thicknesses were greater than those specified for indoor lines and equipment operating at corresponding temperatures, since air velocity and inclement weather greatly increase heat losses and make temperature control difficult.

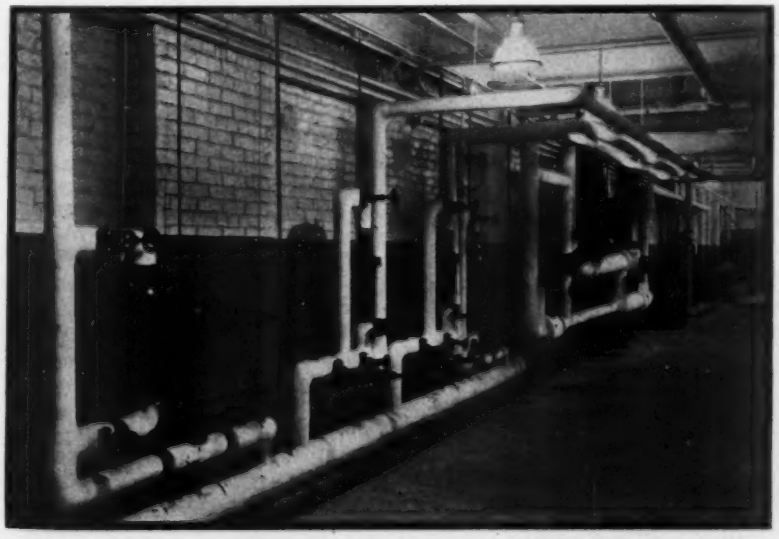
Pipe, Flange, and Fitting Insulation

Before pipe surfaces were insulated, they were cleaned of grease, dirt, scale

LEFT—Quintuple-effect evaporator before insulation. Note effect at extreme right being insulated . . . RIGHT—View of the evaporators after insulation with 85% Magnesia

or other foreign substances that might prevent a tight fit of the insulation.

Single layer pipe insulation was applied with semi-cylindrical sections or curved segments, depending upon pipe size, butted tightly together and each 3-ft. length secured to the surface with three loops of No. 16 gauge copper-weld wire. With double layer insulation, i.e., insulation 3 in. thick or more, or combination insulation, the inner layer was secured to the pipe with three loops of No. 18 gauge annealed wire for 6-in. diameter piping and smaller, and four loops for larger sized piping. The circumferential and horizontal joints of the outer layer were staggered with those of the inner layer. The outer layer was fastened on with three loops of No. 16 gauge annealed wire for pipes 6 in. and smaller, and four loops of No. 14 gauge wire for larger piping.



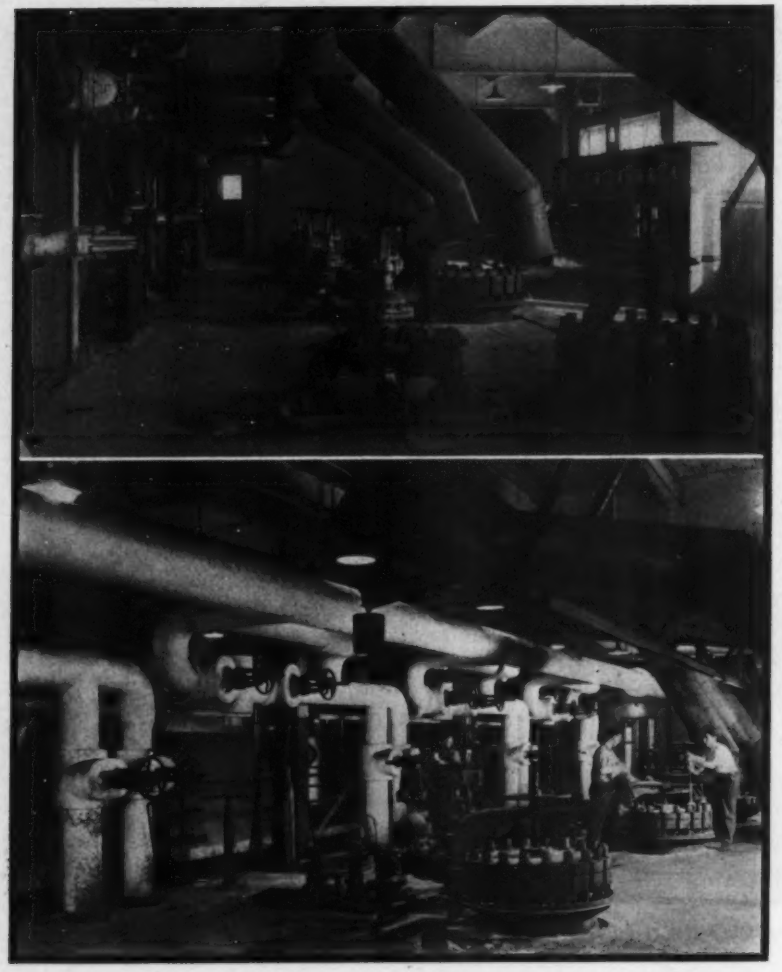
Cascade mill department steam piping, insulated with 85% Magnesia

The ends of the wire were tightly twisted together, bent over and hammered into the insulation to prevent projection through the finish. All joints were pointed up with insulating cement made of the same material as the insulation.

On pipe bends, the insulation was either fitted to the surface by hand, or the sections or segments mitered to fit.

Ends of pipe insulation near flanged connections were beveled at an angle of 45 degrees to permit easy removal of bolts without damage to the insulation.

Flanges on lines operating below 600 Fahr. were insulated with 85 per



ABOVE—View of the top floor of the digester building before pipes were insulated. BELOW—View of digester room after the pipes were insulated

cent Magnesia sectional or segmental insulation of the same thickness as that on the adjacent piping, with the flange insulation overlapping the pipe insulation at least 2 in. at each end. On lines operating above 600 Fahr., the flanges were insulated with diatomaceous silica blocks.

Bodies of flanged fittings and valves, the entire surface of screwed fittings and the entire surface of screwed valves up to the bonnet on pipes 4 in. in diameter and larger were insulated with curved blocks. Block thickness is ½ in. less than the insulation thickness on the adjacent piping. In this case, for operating temperatures above 600 Fahr. diatomaceous silica insulation was used alone. On lines 3½ in. and smaller, valves and fittings were insulated with long fiber, first quality asbestos cement in two layers, to a total thickness equal to that of the adjacent pipe insulation. Portland cement was added to the second layer for a hard finish.

Equipment Insulation

Application techniques for equipment insulation were similar to those described above, except that blocks were used instead of sectional or segmental insulation. On vessels less than 5 ft. in diameter, each layer was secured with No. 14 gauge copperweld wire, spaced 12 in. apart. On large diameter vessels, galvanized steel bands were used instead of the wire.

Vertical equipment was provided with angle bars or supports to keep the insulation from slipping. The supports were welded in place at the bottom and at 15-ft. intervals for the entire height of the vessel. These supports project horizontally ½ in. less than the thickness of the insulation and are equipped with holes to provide anchor points for tie wires. On horizontal tanks or vessels 4 ft. in diameter or larger, similar supports were provided. In that case they were welded along horizontal center lines of cylindrical shells and along both heads of the vessel.

All flange and stiffener angles on the gas and air ducts of the recovery unit were insulated with the same thickness of insulation as that on the adjacent duct surface.

Insulation around manholes, nozzles, yokes, handholes, and other openings was beveled off to remove bolts without disturbing the insulation.

Finishing and Protection of Insulation

Segmental pipe insulation and insulation on pipe bends was finished with one thin coat of hard asbestos cement, troweled to a smooth surface. On valves and fittings on lines 4 in. in diameter and over, the cement was applied in two layers. The thickness of the cement coat was sufficient to make the total insulation thickness equal to that on the adjacent piping.

A single layer of rosin-sized paper was applied over the insulation on pipes, flanges, fittings and valves to provide a smooth foundation for the protective jacket. For indoor lines, the jacket consisted of 8-oz. canvas smoothly pasted on, with 3-in. laps on all edges. On piping exposed to the weather, the jacket consisted of a 50-pound asphalt saturated asbestos felt, with 3-in. laps, and wired on with No. 14 gauge copperweld wire, spaced 4 in. apart. On horizontal piping, the laps were turned down so as to shed water. Where application of a felt jacket was inconvenient, as on small fittings and valves, a fire- and water-resistant asphalt cement was used.

For lines located close to the ground or subject to mechanical abuse, a jacket of No. 26 gauge galvanized sheeting was used.

Indoor equipment was finished with asbestos cement. Hexagonal wire netting, 1½-in. mesh, was applied over the insulation to provide a strong bond between the cement and the molded insulation surface. On large diameter equipment, the wire mesh was anchored to the insulation supports mentioned earlier. The asbestos cement coat ½ in. thick was applied in two layers. The first layer was keyed through the mesh, scratched and allowed to dry, before the second coat was applied. The finish or second coat was troweled on smooth.

Where possible, equipment was heated sufficiently during the application to dry and prevent freezing.

Insulation on outdoor tanks and equipment was first covered with a 1-in. galvanized wire mesh over which were then applied two coats of an emulsified asphalt and asbestos finish to provide durable weatherproof protection for the insulation.

Despite the rather rigorous New Hampshire weather, the weatherproofing has stood up well.

New Sulphate Pulp Mill

Gives Brown Company Integrated Process

▶▶▶ ON THE BANKS OF the Androscoggin River in northern New Hampshire, a new 200-ton sulphate pulp mill and a new 196-inch paper machine have been put into operation this year by Brown Company.

This completely integrated process, with the mill supplying pulp direct through a pipe line to the paper mill, is a major step in the modernization of northern New Hampshire's largest industrial company.

Principally, the new modern kraft mill at Berlin supplies pulp to be made into the well-known Nibroc paper towels and the Nibroc converting papers which have become standards of quality in the paper field.

The new machine, designed to run at 1200 fpm, makes possible added production of these papers, particularly towels.

Although a sulphate pulp mill is new to Berlin, it is not new to the Brown Company. Brown was a pioneer in the development of sulphate pulps. The La Tuque (P.Q.) mill of its wholly-owned subsidiary, Brown Corporation, was a pioneer sulphate pulp mill on the North American continent.

At La Tuque were made the first sulphate pulps of high alpha content and the first satisfactory bleached kraft on this continent. There also were instituted many improvements in kraft pulp bleaching, improvements that have become standard in the industry.

The La Tuque mill, which began operation in 1910, was built originally to supply unbleached kraft to the paper mills in Berlin. It was later expanded to produce, in addition, specification pulps for the market, such as the well-known cellate and solka pulps.

Now that the new mill has begun operation at Berlin, La Tuque will place more and more emphasis on the production of these specification pulps for the market.

No overnight decision brought the new mill and the new machine to Brown Company. The entire project was the result of long and careful study.

Manufacturing, woods, sales, research, and financial personnel made detailed examination of market, raw material supply, and manufacturing problems.

One of the studies brought into the picture a most modern method of surveying the basic raw material—wood. Brown Company was one of the first forest industries in the United States to make an aerial survey of its own woodland holdings and other wood sources. From this survey it was learned that the area economically accessible to the mills at Berlin could furnish a continuous supply of pulpwood for those mills. Directing this survey was Herman G. Schanche, vice president in charge of woods operations for both the Brown Company and Brown Corporation.

This article and illustrations were supplied through the co-operation of the Brown Company

When a decision to build the new mill and new machine was reached, the Manufacturing Department, the Research and Development Department, and the Engineering Department, together with O. C. Schoenwerk, consulting engineer of Chicago, made detailed studies of most modern methods in use throughout the country. Thus the mill and machine embrace the most up-to-date and most practical ideas possible.

Behind the development of this integrated project are such men as F. G. Coburn, president of the company; Wentworth Brown, vice president in charge of manufacturing; Ernest H. Maling, vice president in charge of finance and accounts and treasurer; D. P. Brown, vice president in charge of sales; E. E. Morris, works manager; George A. Day, research and development director, and C. A. Johnson, chief engineer, all of whom are recognized leaders in their fields.

Frederick G. Coburn
President of Brown Company

Detailed engineering and construction of the new mill and machine was handled by the Rust Engineering Company of Pittsburgh.

In designing the integrated project, the company made use of as much of its present facilities as possible. An example of this is wood handling. The same facilities serve both the new kraft mill and the older sulphite mill.

PULP MILL

Power and steam and other services which have been supplied the sulphite mill also are being utilized in the sulphate mill.

Four welded digesters, furnished by General American Transportation Corporation, are used in the new mill. Standing 48 ft. high and with a diameter of 11 ft., 2 in., they have a 3,800 cu. ft. capacity and are designed for 125 pounds pressure. They are equipped with Fibre Making Processes bottom screens and are arranged for direct or indirect cooking. Complete instrumentation with automatic controls on liquor measuring tanks, cooking cycle, inert gas relief, etc., has been provided by The Foxboro Company.

Chips come to the digesters on a conveyor from the sulphite digester house chip loft and each charge is measured exactly by a Weightometer (made by Merrick Scale Manufacturing Company).

The digesters discharge into two blow tanks, 60 ft. high, over-all, and 26 ft. in diameter. Dilution is controlled automatically by a Foxboro controller.

From the digesters, the pulp moves to a three-cylinder vacuum washer supplied by the Oliver United Filters, Incorporated. This has been designed to operate on hardwood and softwood alternately.

Jonsson pulp screens (made by Bird Machine Company) ahead of the washers remove all knots or uncooked

Panoramic view of Rice Barton paper machine and allied equipment from wet end. Dilts Hydrafiner is at the left, and at the right are the Bird screens. A part of the Hydrapulper can be seen at the extreme right →

chips, which greatly improves the washing efficiency.

Washed pulp is stored at high density in six large concrete tanks, 65 ft. high and 30 ft. ID. The tanks provide 600 tons of storage, which is an important advantage in supplying the various pulps to the paper mill.

Pulp is pumped from the storages through automatically controlled equipment to flat screens, which were a part of the original sulphite mill equipment. The arrangement and capacity of these screens is such that exceptionally clean stock is obtained.

After screening, the stock is thickened and delivered to a pumping chest, where consistency is controlled by a Brammer regulator (made by Paper and Industrial Appliances, Inc.), and then pumped by low lift pumps to the pipe lines leading to the paper mill, nearly two miles down river.

The liquor that is washed from the pulp is sent to a six-body, quintuple effect evaporator, furnished by General American Transportation Corporation. Here the black liquor is concentrated from 15 per cent solids to 55 per cent solids for combustion in the recovery furnace. The unit is designed with equal heating surface in each of the six bodies. A vacuum of 26 inches is used in the fifth effect, obtained by use of a barometric condenser equipped with a steam jet ejector. Heat is supplied by steam at 35 pounds pressure.

The unit is designed to give an economy of 4.04 pounds of evaporate per pound of steam furnished, Six tangential inlets and centrifugal type entrainment separators give entrainment losses below 0.1 per cent of the total solids fed to each body.

Black liquor pumps are of high alloy steel, while carbon steel tubes are provided in all but the first two effects, where stainless steel is used. Liquor deflectors in the first effect vapor bodies are 20 per cent stainless clad on the impingement side. The lower part of the two vapor bodies of the first effect are lined with stainless alloy No. 304. The tube sheet in the first two heating elements is of 20 per cent stainless clad.

Like other units, the evaporator system is completely instrumented and its operation is principally automatic.

The recovery furnace was supplied by the Combustion Engineering Company and is designed for 680,000 pounds of solids in 24 hours. Steam is generated at 450 pounds pressure. The recovery furnace generates about 100,000 pounds of steam an hour. A cascade disc evaporator is used for final concentration of the black liquor.

An electric precipitator, built by the Research Corporation, thoroughly cleans the flue gases and recovers entrained salt cake before they go up a 250-foot acid-proof lined concrete stack.

The causticizing equipment, supplied by General American Transportation Corporation, provides complete facilities for slaking, causticizing, green liquor clarification and lime recovery.

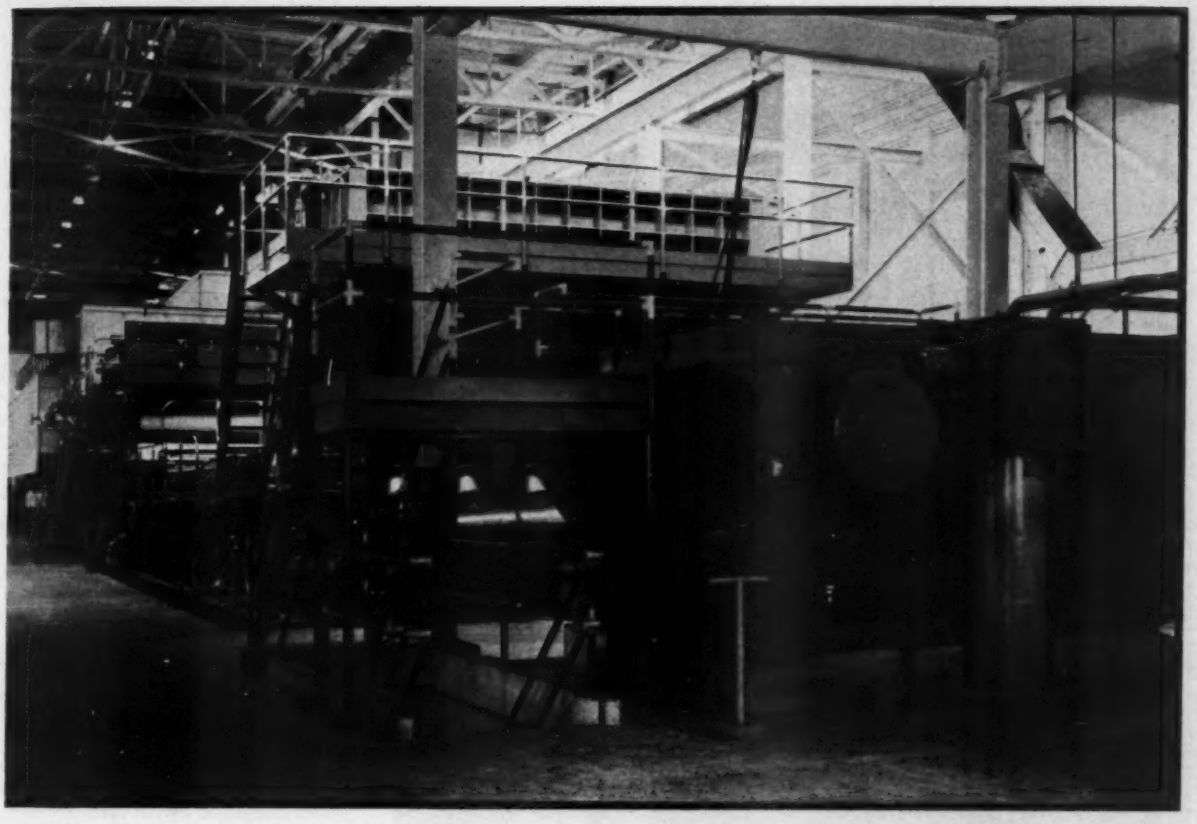
Unclarified green liquor flows continuously to a regulating tank, from which it is pumped to a three-compartment clarifier and then to a green liquor storage.

The dregs from the clarifier are pumped to a three-compartment counter-current dregs washer.

Clarified green liquor is pumped through a Rosenbladt spiral heat exchanger with automatic flow control (made by Fibre Making Processes, Inc.) to a rotary type slaker, seven feet in diameter by 30 feet long.

Lime is fed continuously to the slaker through a Ross feeder.

Slurry discharged from the slaker flows to a screw classifier. Now free of large particles of unslaked lime or other impurities, the slurry moves to three causticizing or reaction tanks equipped with turbo-agitators. From the tanks it



flows by gravity to the 30-foot diameter by 20-foot high three-compartment clarifier.

Clarified white liquor is pumped to storage and the lime mud is pumped to a mud washing clarifier, a duplicate of the strong white liquor clarifier.

All traces of soda are washed out by a Conkey filter (General American Transportation Corporation) and the lime mud, at about 50 per cent moisture content, is fed by a screw conveyor to the lime kiln.

Heart of the lime recovery system is a rotary kiln supplied by General American, seven feet in diameter and 250 feet long, rated at 70 tons of CaO per 24-hours. The feed end for a distance of 40 feet is equipped with heat recuperative chains. The kiln is fired with fuel oil using a Hauck Manufacturing Company burner.

Equipment includes four 14-inch tires of floating design and eight water-cooled supporting trunnions.

The lubrication system is new to lime kiln design. The Bowser forced feed lubrication with heat exchangers and strainers is used. Cooling of the lubricating oil is possible when the kiln is running hot under normal conditions.

Driving the lime kiln is a 40-hp., variable speed d-c motor.

The unit is completely equipped with panel board and instruments, including a carbon dioxide indicator, draft indicators at four points, oil temperature and pressure gauges, oil tank level and temperature recorders, automatic six-point temperature recorder and alarm signals on bearings and thrust bearings.

Crushed limestone is fed to the kiln by a Ross feeder with the sludge, for replacement of lime lost in process.

Stack gases are passed through a wet scrubber, which completely removes all lime dust so that only clean flue gas and water vapor are vented to the atmosphere.

Reclaimed lime is conveyed to a storage, from where it repeats its cycle.

The new kraft pulp mill and the Cascade paper mill are connected by three parallel pipe lines, each 11,000 feet long.

Two woodlined lines, each 16 inches in diameter, receive the washed and screened pulp in slush form from the kraft mill. The pulp moves by gravity flow following the grade of the river to the Cascade Mill.

The third pipe line, 22 inches in diameter, carries fresh water from the Burgess water filter plant to the paper mill.

PAPER MILL

When the pulp enters Cascade Mill it is thickened to proper consistency for use in the stock preparation system by two Oliver thickeners. After passing through a DeZurik Shower Company consistency regulator, it is dropped into either one of two tanks depending on its grade, either softwood or hardwood. Each tank holds 17.5 tons at 5 per cent consistency.

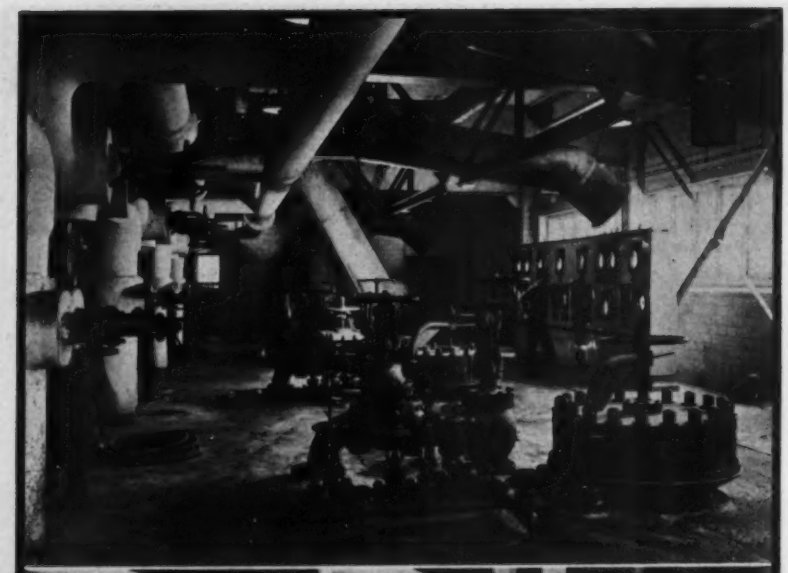
Four emergency receiving tanks are provided in case of failure of the thickeners or other equipment. These tanks will take the entire volume in the stock lines at its 1 to 1½ per cent consistency.

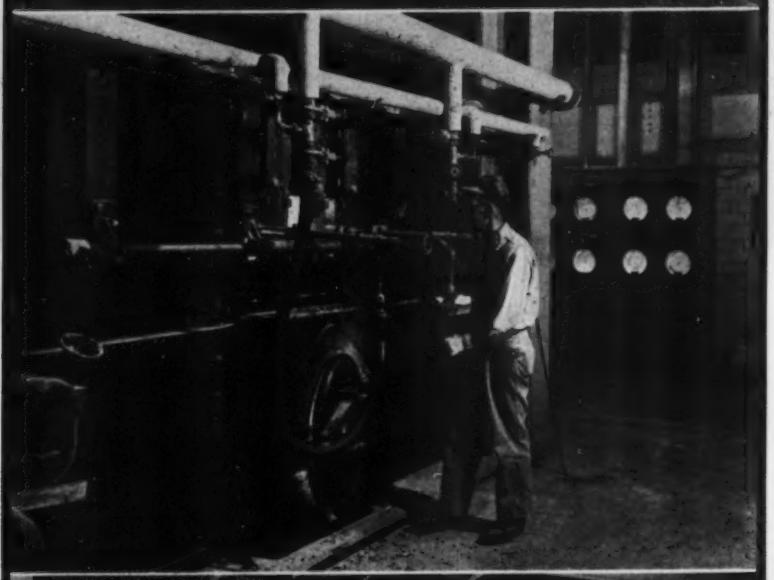
Provision also is made for pumping to additional storage in seven sulphite digesters, formerly used in the Cascade Sulphite Pulp Mill. Each has an eight-ton capacity.

The emergency and receiving tanks are tile lined with the receiving tanks having Noble and Wood propeller type agitation to keep the stock in movement at its 4.5 or 5 per cent consistency.

From these tanks, the stock is pumped to slush tanks that supply the new paper machine. The stock then is supplied to two cylindrical conical-bottom cycling tanks, where pre-hydration is given it to the degree desired by means of a Dilts Hydrafiner.

It is drawn to a 20-foot Dilts Hydrapulper, where the furnish to the paper machine is completed in the propor-





Looking into the new sulphate pulp mill of Brown Co.

Top—Digester floor

Center—Recovery furnace

Bottom—Rotary kiln

tions of hardwood, softwood, groundwood or other fibers used, as well as the addition of chemicals. Here either slush or baled lap stock may be used.

The entire operation from the time the stock enters the mill is automatically controlled by a single panel push button arrangement supplied by the Foxboro Company. All level recorders are in view of the operator handling the operation at all times.

The same holds true in the pulp preparation in the beater room, where the stock is drawn to the cycling tanks. All is controlled by automatic arrangement on one panel under the control of a stock furnisher.

From the Hydrapulper, the stock is discharged into an agitated tile-lined machine chest, from where it is pumped to a flow box supplying three Dilts Hydrafiners. It is then fed to another flow box supplying two Emerson Manufacturing Company jordans. There it is given its final treatment for proper degree of hydration.

From the jordans, the stock moves to a Brammer consistency regulator. The regulated stock goes to the primary fan pump, where predetermined dilution is added from the wire pit manifold to give best operating consistency to the two Bird screens before it is dropped to a secondary pump. This latter pump moves it through a manifold header to the Rice Barton head box on the paper machine.

All piping conveying stock to the head box of the machine throughout the entire pulp preparation system is woodlined or of stainless steel.

The two Bird screens equipped with Dirtec Paper Dirt Removers (Bird Machine Company) are on the machine floor level. This is accomplished through the use of the secondary fan pump equipped with Beloit valve on the discharge side for static head control at the slice by means of remote operation by the machine operator from the operating floor level.

The head box is completely stainless steel lined. It is equipped with a Van de Carr inlet slice, made by Dominion Engineering Works.

Water from the white water tank retrieving the Oliver thickener effluent is piped for stock preparation and other mill use.

Paper Machine

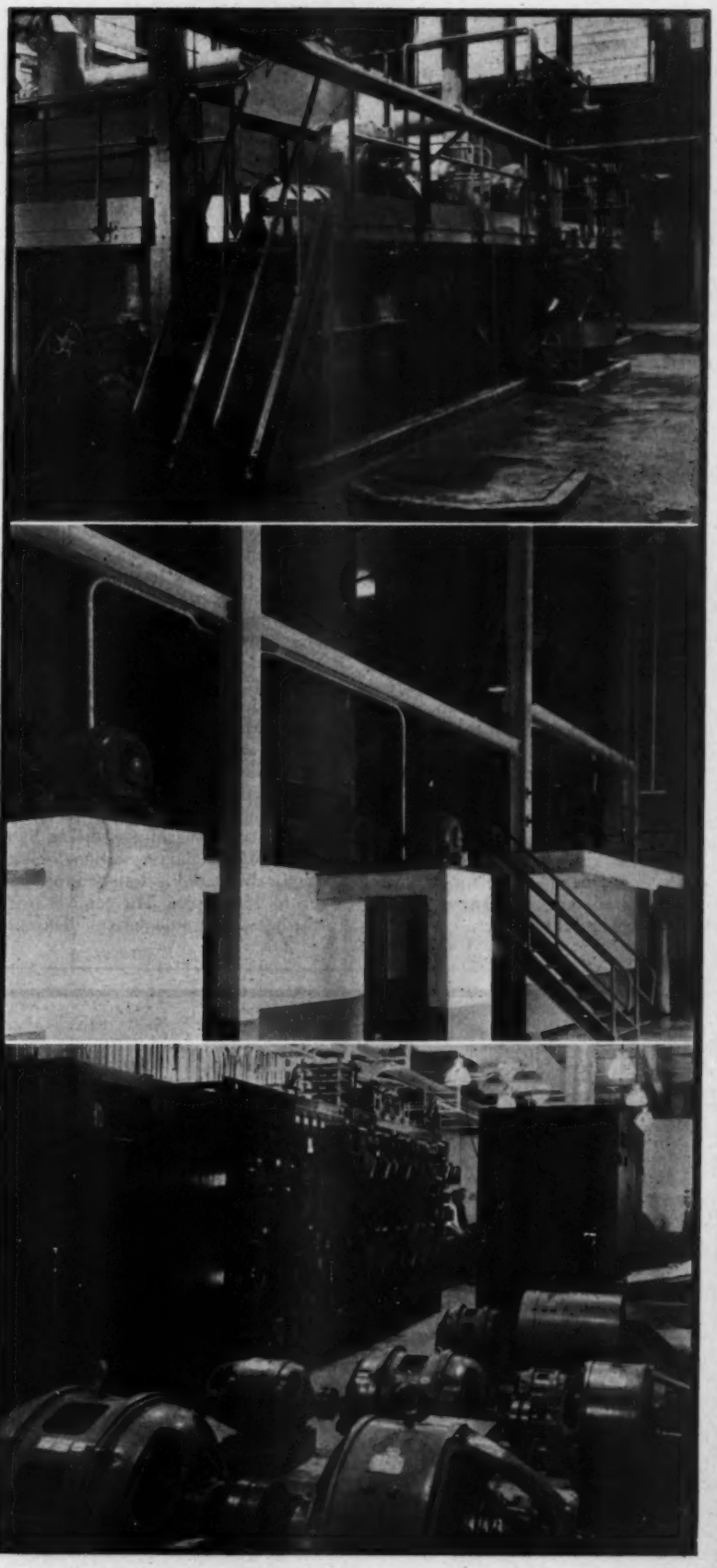
The paper machine, itself, "Mister Nibroc," is a Rice Barton Yankee type

towel machine. It consists of a fourdrinier part, first suction press, second suction press, pressure roll, top felt suction roll, bottom wet felt equipped with wringer rolls, a 12-foot Yankee dryer, pre-set crepe dryer and dryer section with a two-roll hydraulically equipped calender, center-line pope reel, unwinder with regenerated motor brake control and a Rice Barton winder.

The fourdrinier part consists of a 196-inch width wire by 100-foot length with the latest modern removable features developed by Rice Barton. When changing a wire the fourdrinier rolls into the tending aisle on swing beams located over the pit and then on to removable beams located in the tending aisle. The wire is then draped over the pit from stringing devices that support the wire when the fourdrinier section is moved back into place.

The fourdrinier is equipped with a 30-inch diameter breast roll, all rolls dynamically balanced to 1500 fpm and better. The table rolls consist of six dandy-type construction, 16-inch diameter by 204-inch face, followed with additional conventional type table rolls of 11-inch diameter, rubber covered. Five stainless steel suction boxes are equipped with end of grain maple covers and have hydraulically equipped crosswise oscillation. The suction boxes are equipped with two Nash-Hytor Vacuum pumps and two Jennings water pumps (Nash Engineering Company).

The wire pit is of tile-lined construction and under the couch is a pit with propeller type agitation, where the consistency is controlled automatically



Top—Oliver thickeners in the paper mill. Pulp flows from the new kraft pulp mill to the Cascade paper mill by gravity through two pipelines, 11,000 ft. long

Center—Dilts Hydrapulper and stock tanks

Bottom—Electronic control room at paper mill

by an electronic device, and the stock pumped back to the machine chest whenever stock is dropped from the couch roll. The bottom couch is of the circumferential grooved type, 36-inch diameter, and carries an upper couch roll of 28-inch diameter. The two suction presses are of Beloit design and are of 36-inch diameter with 28-inch diameter rubber-covered top press rolls. The top felt suction roll is not rubber covered.

The pressure roll is of 28-inch diameter, electrically driven. Provision is made for installation of a suction type pressure roll should it be desired.

The Yankee Dryer is of Beloit construction, 144-inch diameter, 203-inch face.

All loading on the presses, pressure rolls, etc. is accomplished hydraulically with Vickers pump arrangement. Felt stretch rolls are motor equipped, being handled from the tending side convenient to the machine operator. The couch raising and lowering device is also hydraulically equipped.

Following the Yankee Dryer there is a 60-inch diameter crepe set dryer, further followed by 25 additional 60-inch diameter by 194-inch face dryers in two sections; the first comprising eight, and the second section of 17 dryers. Five felt dryers are also provided.

Following the creping doctor and the wormed crepe carrier rolls, the sheet enters the first crepe set dryer by means of a Sheehan rope carrier (made by Bagley & Sewall Company), and is conveyed through the dryers, through the calender rolls and to the pope reel, where air devices engage it with the reel spool. This eliminates the human element of handling as conventionally done on a pope reel. The bottom calender roll is of 30-inch diameter, 194-inch face, while the upper roll is of 24-inch diameter, 194-inch face. The upper roll is equipped with hydraulic loading and unloading device and is driven as well as the bottom roll.

From the pope type uniform speed reel, the reel spools are transferred to an unwind drum of 42-inch diameter by 196-inch face equipped with a pair of pivot arms for holding the reel spool bearings. The unwind reel is equipped with regenerative motor that acts as a dynamic brake for producing the desired tension between the unwind reel and the winder.

The winder is of Rice Barton construction, suitable for operation at 4000 fpm. The drums are of 22-inch diameter by 190-inch face. A special feature of the drum is outward rotation, standing at the front side, eliminating ingoing nip. This prevents any operator from becoming injured by falling into or by getting caught in an ingoing nip, i.e., the rotation of the drums is counter-clockwise rather than the conventional clockwise, standing at the tending side facing the winder.

Slitters are of the top and bottom shear type, and are pneumatically equipped for engagement or disengagement by remote push button control by the operator. Slitters are individually motor driven type.

A floor level dolly track received the rewind roll from the winder. This is shunted to the towel converting room without further manual effort.

The oil system is of the latest Bowser type for lubrication of bearings, equipped with receiving tank, filters and pressure tank to supply circulating oil to the bearings of all dryers, idler gears, driving pinions, calender rolls and main gears. All dryer gears are enclosed.

The J. O. Ross Engineering Corporation's dryer hood and Yankee hood over "Mister Nibroc" is of the latest design and installation equipped with economizer and scrubber attachments for re-circulation of air, balanced to room conditions.

The entire machine is driven by the latest Westinghouse sectional electric motor drive, and is designed for speeds up to 1500 fpm. The controls are of the latest electronic devices. The entire length of the machine room is traversed with a Northern Engineering Company's crane of 20 tons capacity, facilitating changes of machine clothing or removal of parts of the machine for repair.

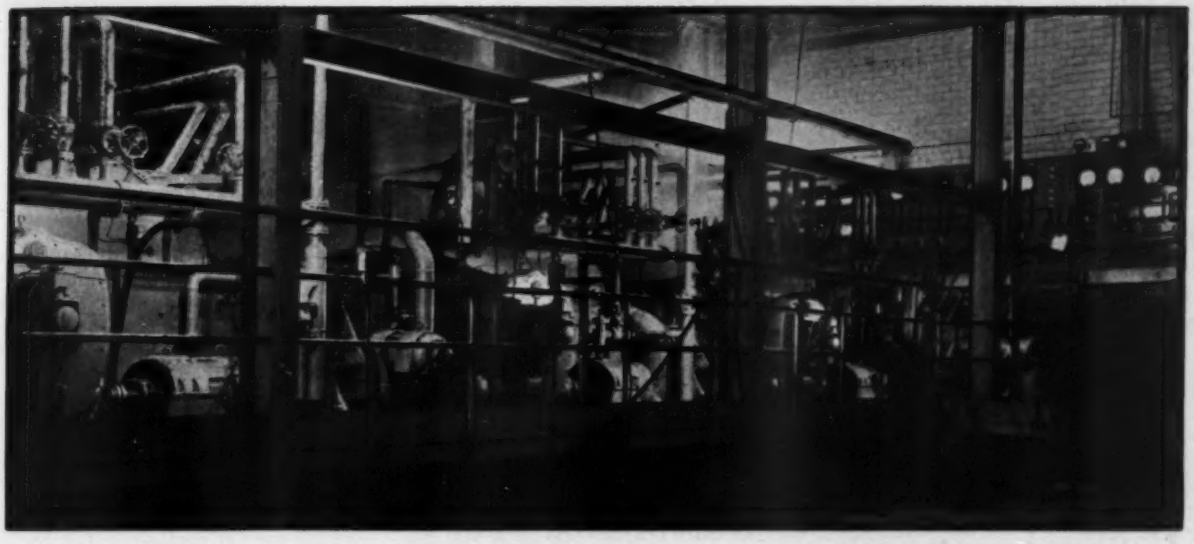
Brown Co. Men Who Have Contributed to This Work

Operation of the new mill and new machine is being directed by men who have had long experience in their fields. L. M. Cushing, manager of the Pulp Manufacturing Division, has been with Brown Company for 25 years. C. R. P. Cash, general superintendent of the division, came to Berlin from La Tuque, where he served as superintendent. Lamar M. Murray, superintendent of the kraft mill, has had kraft experience with a number of leading mills in this country and Mexico.

Manager of the Paper Manufacturing Division is Walter A. Johnson, who came to Brown from the Middle West, where he had wide experience in operating paper mills. General superintendent of the division is J. Raymond Almand, who has come to Brown from a large paper corporation, where he held a similar position. Ervin Vickman, a long-experienced operator of paper machines equipped with Yankee dryers, will have direct supervision over "Mister Nibroc."

Behind these supervisors are other men of Brown, many of whom have been making pulp or paper for the company for many years. There are such men as Temple Birt, Archie Belanger and Wilbrod Carrier, causticizing operators, who have been with Brown for more than 34 years, and

Wet end of the new "Mister Nibroc" paper machine and Beloit Yankee dryer



A three-cylinder Oliver vacuum washer in the new sulphate mill has been designed to operate on hardwood and softwood alternately

John Belanger, William Gagnon and Francis Sweeney, digester cooks, who joined the company in 1913, 1915, and 1923, respectively.

There are other men of the company who have contributed much in making possible the building and operation of this integrated project—men such as J. E. Mullaney, project manager and now acting chief engineer; Henry W. Stafford of the Engineering Department, who served as project engineer; Bernard Covieo of Engineering, who directed instrumentation work; Arthur Brosius of the Paper Division; Wilfred Lepage of Engineering, who did considerable work in layouts, particularly of auxiliary equipment pertinent to the paper machine; George Craig, then plant engineer at Cascade, now with the central Engineering Department, and Ernest P. Cook, assistant chief engineer.

While officials in Berlin have been directing the building of the new project, members of the Sales Department in New York have been preparing for the output of "Mister Nibroc" and increased paper production.

Heading the sales group is D. P. Brown, vice president in charge of sales. Distribution of the company's paper products is directed by G. F. Henderson, manager of the Paper and Towel Sales Division, assisted by H. E. Moley, assistant manager of the Paper Division, and W. T. LaRose, assistant manager of the Towel Division. These divisions now give maximum efficiency in distribution of the products which will flow from this modern combination of production facilities.

A major step of modernization has become a reality—a step completed by a team of production, woods, research, sales and financial personnel working in close co-ordination.

That there will be other steps is a certainty. Plans already are being formulated and Brown Company officials have promised that as fast as funds become available these steps will be taken.

Overtime-on-Overtime

Through its executive secretary, E. W. Tinker, the American Paper and Pulp Association on June 25 released the following digest of a ruling by the higher court on an important labor question:

A great many companies in this and other industries are at a loss as to payment of wages due to their employees who work over 40 hours per week, because of the recent Supreme Court decision on what constitutes a regular rate of pay.

Mr. McComb, administrator of the Wage and Hour Division of the Department of Labor, has announced that employers who have treated premium pay for Saturdays, Sundays, and like periods as overtime and relied on the Administrator's rulings in good faith, will not, in most cases, be liable for back payments, since the Portal-to-Portal Act gives them ample protection.

But he goes on to say that starting July 1, paragraphs 69 and 70 of Interpretative Bulletin No. 4, no longer will be in effect. These paragraphs said in substance, that premium pay for certain days as such could be treated as overtime and credited against accrued weekly overtime. This, the Administrator says, can no longer be followed because of the court's decision. This decision is neither specific nor clear.

In the paper industry there are a great many variations in the wording of employee contracts and policies. It is felt that because of the general understanding of these contracts, no one can suggest the possibility that employers or unions have misinterpreted the intent of such agreements.

Now the court says in effect, that regardless of collective bargaining agreements, extra compensation for Saturday and Sunday and holiday work, or work outside the regular working hours, can no longer be credited against weekly overtime. Just how far-reaching this ruling will be or what its ultimate effect will be is not known at this time.

It is known that the Department of Justice, the Army, Navy and Maritime Commission are pressing for a review of the case, and it is also indicated by the Wage and Hour Division that the Administrator will come out with a new directive shortly. Attorneys for the Employers, and Longshoremen's Union, question the propriety of such a directive since the Supreme Court instructed the Lower Court to arrive at a basis for figuring the rate of pay, which has not been done as of this date. However, until further information is forthcoming from the Wage and Hour Administrator, it is not possible to inform the industry as to the procedure after July 1, but it is quite probable information will be at hand shortly.

Magnetic Drives *For Paper Mills*

G. L. OSCARSON
Chief Application Engineer
Electric Machinery Manufacturing Company

▸▸▸ ONE OF THE MAJOR users of electric power is the paper industry. Without exception, this power is supplied from alternating current, fixed frequency systems. Thus, all motors operating from these systems may be alternating current motors. Although alternating current motors are essentially constant-speed devices, many processes require variable speeds.

The Adjustable-Speed Magnetic Drive, which operates on the slip coupling principle, provides a ready means of securing precisely-controllable, adjustable speeds needed for these applications.

Magnetic Drives

The simplest type of Magnetic Drive is shown diagrammatically in Figure 1. This construction is used through 600 hp. at 900 rpm. Direct-current excitation is applied to the magnet, or field winding, through the collector rings. As the driven element, or ring, is turned at motor speed, there is relative motion between it and the magnet. If the magnet is excited, this motion includes eddy currents in the ring and causes a turning torque to be transmitted through the air-gap. At any slip, the *amount of torque transmitted is roughly proportional to the excitation. By varying the amount of excitation, the transmitted torque can be controlled.*

Figure 2 shows the magnet for this type of drive. It is essentially the same as the field structure of a synchronous generator or synchronous motor. This magnet, and also the ring, are overhung on two "sound tested" antifriction bearings. These bearings are widely separated and mounted in a substantial pedestal to assure proper rigidity. *There is no mechanical connection between the rotating elements.*

The other type of construction is illustrated diagrammatically in Figure 3. In capacities above 600 hp. at 900 rpm. it is difficult to dissipate the heat in the eddy current construction. A laminated core and a squirrel-cage winding are used instead. However, the width of the ring becames so great that it is not feasible to overhang it as is done on the eddy current type.

Alignment is maintained by internal roller bearings placed at A and B in Figure 3. The outer race of these bearings is pressed into the ring spider housing and the inner race is pressed on to the magnet shaft. The final clearance in the bearing is approximately .002 inches—resulting in a quiet and smooth running machine at operating temperatures.

Figure 5 shows the common types of the cage-type ring member. It is essentially as simple as the rotor of a squirrel-cage motor consisting primarily of a laminated core, with ventilating ducts and a squirrel-cage winding. Two sets of cage bars and two end rings are often provided.

Figure 5 shows the common types of Magnetic Drive and driving motor assembly. These drives can be provided as self-contained two-bearing units with base; or as two-bearing units with extended sub-base on which the motor is mounted.

The Magnetic Drive is essentially a simple piece of equipment. It is cooled entirely by self-induced windage action. No water line, oil lines, or coolers are required. By the addition of a simple housing, it is entirely suitable for outdoor installation, requiring no space heaters to prevent damage from congealed oil or frozen water lines where freezing temperatures are encountered.

Speed Control

The speed control may be necessary to maintain a desired air flow, liquid level, pressure or some other reference value. As will be described later, some means of relating the measured reference to the Magnetic Drive speed must be provided. The speed control then maintains the required speed and, thus, the desired operating condition.

Figure 1

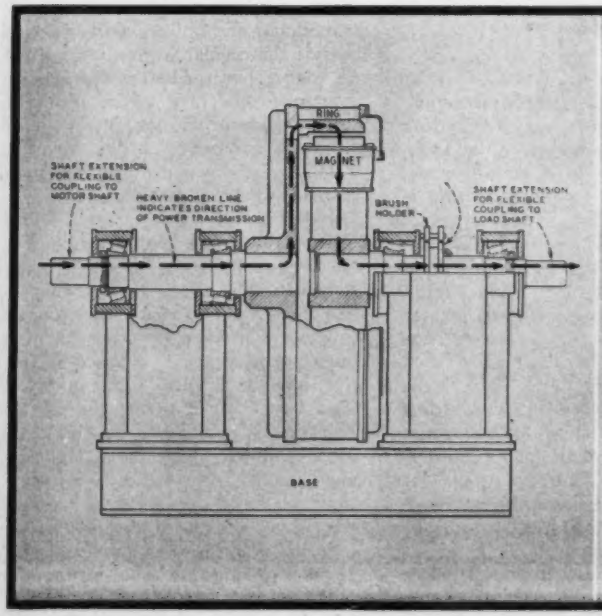
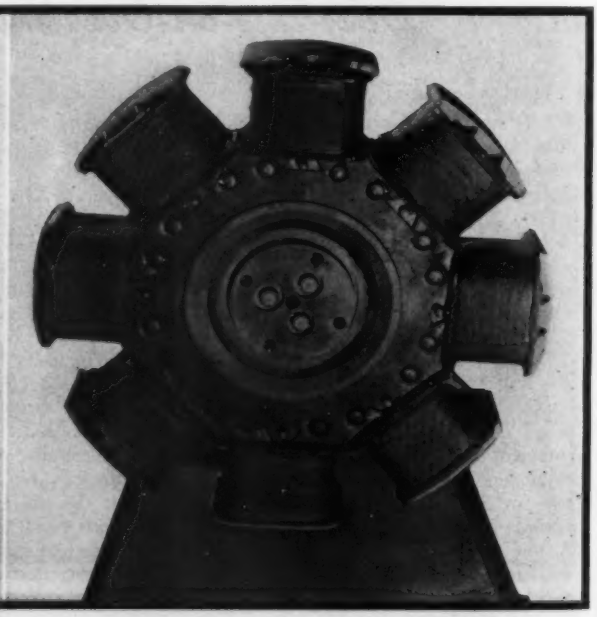

RING
MAGNET
SHAFT EXTENSION FOR FLEXIBLE COUPLING TO MOTOR SHAFT
HEAVY BROKEN LINE INDICATES DIRECTION OF POWER TRANSMISSION
BRUSH HOLDER
SHAFT EXTENSION FOR FLEXIBLE COUPLING TO LOAD SHAFT
BASE

Figure 2



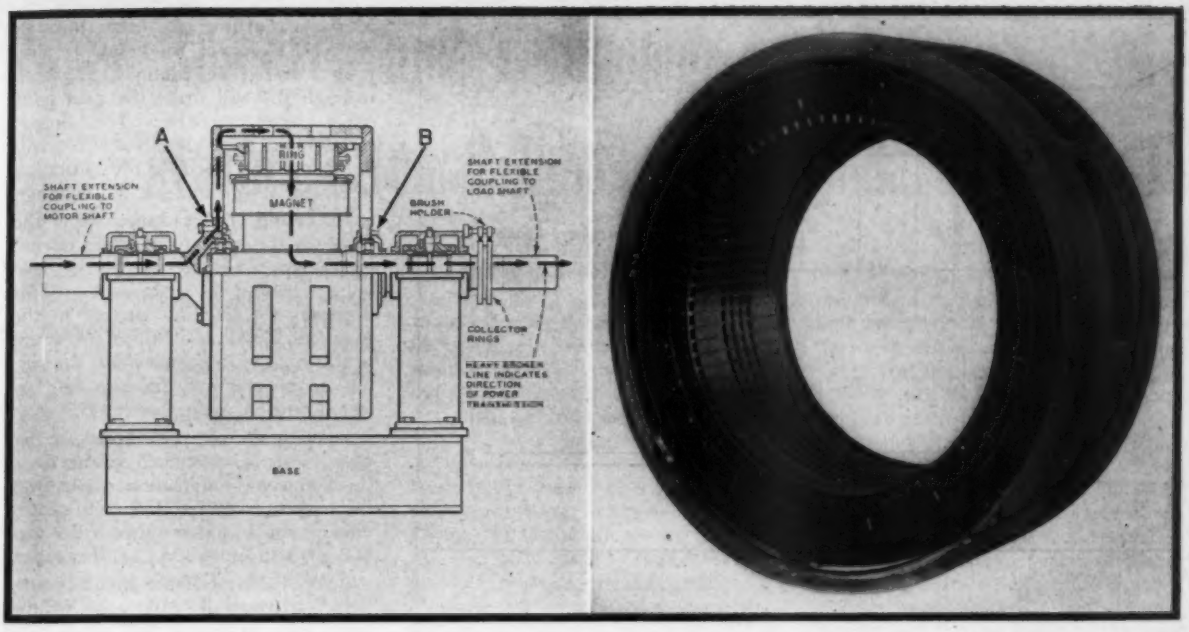


Figure 3

Figure 4

A small permanent magnet tachometer generator is belted to the output shaft of the magnetic drive. This delivers 12 volts at 100 per cent speed. This output is rectified and appears as a d-c voltage on the control circuit. This voltage is *exactly proportional* to speed.

The exciting current to the Magnetic Drive is supplied from six grid-controlled, gas-filled power rectifier tubes. The output of these tubes is controlled by the phase angle of the grid voltage; an advance in the phase angle providing for more excitation. This characteristic is shown in Figure 6. Ep represents plate voltage; Eg, the grid control voltage lagging the plate voltage by 120 degrees; and Eb, the fixed negative bias voltage. The critical voltage of the tube is represented by Ec. The tube will start to conduct when Eg crosses Ec and any advance in phase angle of Eg from that shown in Figure 6 will permit the tubes to conduct.

• Basically the circuit is shown in Figure 7. The output of the tachometer generator G is balanced through the potentiometer P against a portion of the fixed reference voltage from the 12 volt battery B. The difference between the two voltages is impressed on grid g of VT-1, resulting in some definite load speed. The potentiometer may be actuated by a reversing motor, air operated piston, or any other means which can be converted into rotary motion. *The speed of the Magnetic Drive will be a straight line relationship,* referred to contact position $\pm\frac{1}{2}$ per cent from 15 per cent to 100 per cent speed.

Assume that the driven load starts to speed up. The voltage generated by G will increase in value and will make the grid g of VT-1 more positive. This

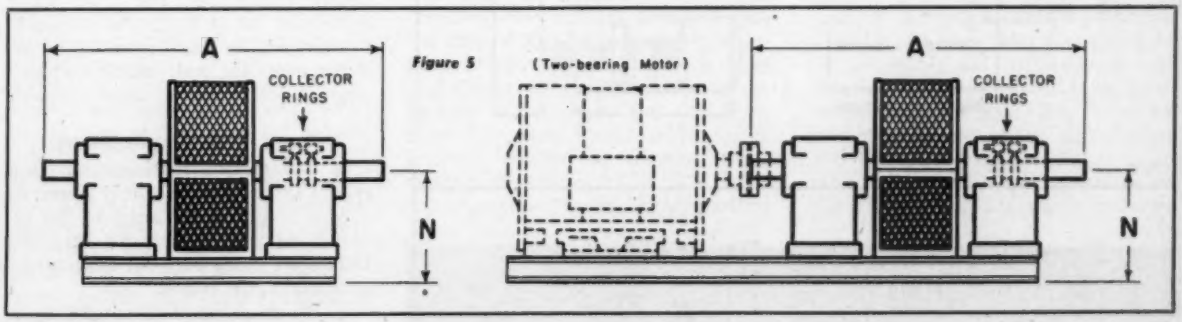


Figure 5

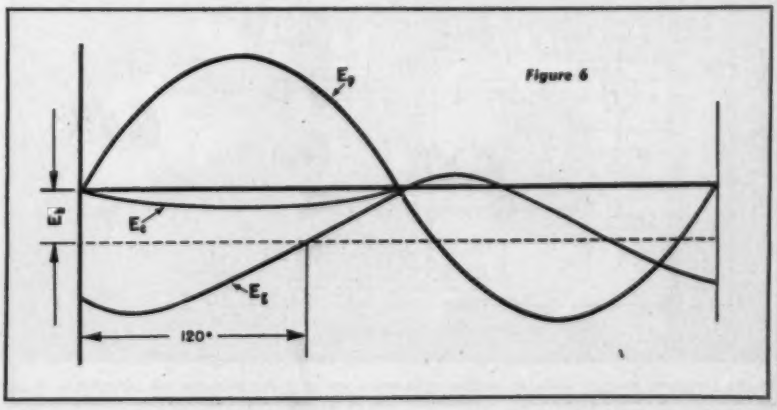


Figure 6

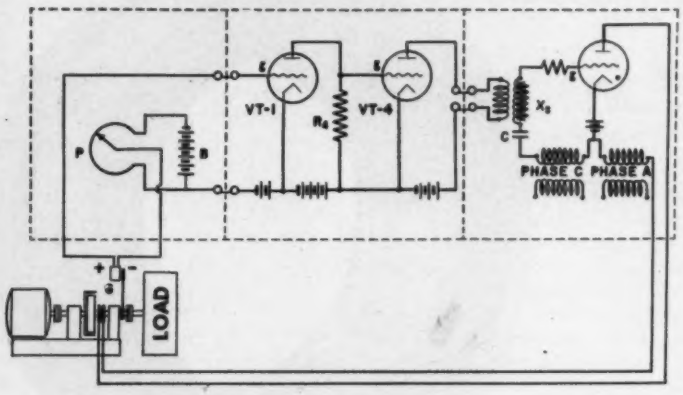


Figure 7

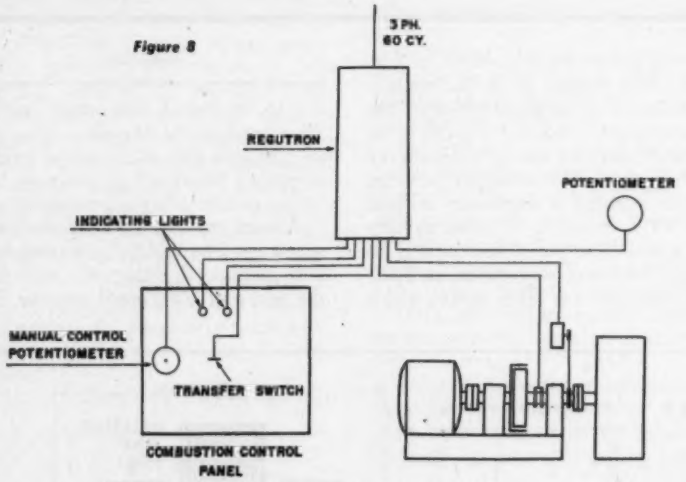


Figure 8

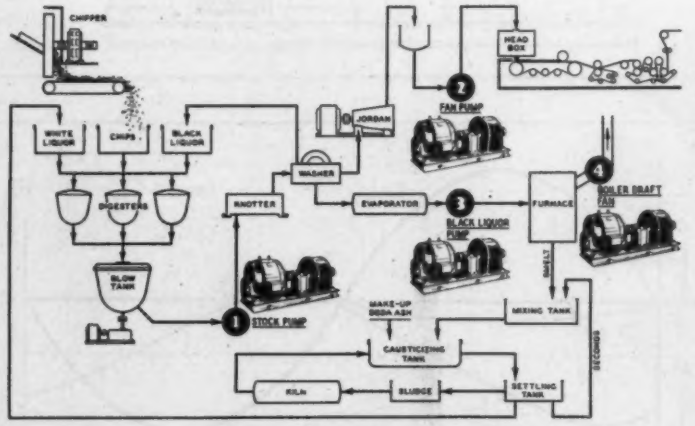


Figure 9

increases the flow of current through the plate circuit of VT-1 and through resistor R4. The resultant IR drop through R4 will make the grid g of VT-4 more negative. The output through the plate circuit of VT-4 will then drop and decrease the saturation in reactor R and increase its reactance.

Increasing the reactance shifts the phase in the reactor-condenser circuit, which increases the lag of the grid voltage behind the plate voltage. This decreases the exciting current to the Magnetic Drive and brings the speed of this back to the point where the output of generator G balances the selected portion of the battery B.

Actually the batteries shown are not used. Instead, rectified output of a constant voltage transformer is used as the reference voltage. The plate supply voltage for amplifier tubes VT-1 and VT-4 is also supplied by rectifier tubes.

The sensitivity of the circuit is such that a change of .003 volts in the tachometer generator will result in a swing to either zero or full excitation, depending on whether speed is too high or too low. Due to this sensitivity, an antihunt circuit and a snubbing circuit is provided to insure stability. The antihunt circuit prevents hunting under steady load conditions. The snubbing circuit acts only when a new speed is called for. It slows down speed change as the new speed is approached and prevents overrun.

The line diagram in Figure 8 shows general connections. The power input is 3 phase, 60 cycle, 220 to 600 volts. Connections are made from the tachometer generator and magnet collector rings to the Regutron control cabinet.

Paper Mill Applications

A digrammatic representation of a typical kraft recovery unit is shown in Figure 9. Of course many of the essential elements are left out. Magnetic Drives are being used for applications indicated in the sketch.

1. To obtain satisfactory washing, it is necessary to have a uniform thickness of stock on the washer screen. This necessitates accurate control of stock flow through the centrifugal pump indicated on No. 1. Throttling by means of partial closing of a valve is not satisfactory, as knots in the stock cause clogging. An unobstructed passage is essential. So to control the flow of stock to the washer, control of the stock pump speed is desirable. This control is influenced by a wide range of pressures in the blow tank.

The Regutron provides for this control of pump speed and may be tied in with either stock level in the washer or pressure in the blow tank.

(Turn to page 581)

Paper Research and Technology at the National Bureau of Standards---Part II

BOURDON W. SCRIBNER

▶▶▶ A SYSTEMATIC STUDY of the whole problem of preservation of written, printed and photographic-film records was started by the Paper Section in 1929. Prior to this, information on the permanence of the record materials, on how components influence their aging quality, and on the optimum conditions for the preservation of records, was very fragmentary and not at all conclusive. At the request of the American Library Association, the Carnegie Foundation supported Research Associates to assist in the investigation, and such support was also given by the National Archives, the Department of Agriculture, the Social Security Board, and by manufacturers of record materials. The research resulted in universally-recognized standards of quality for record materials and standard practices for the preservation of records.

4. Preservation of Records

(a) Permanence of Record Materials

In investigation of the relation of components of record materials to their stability and strength, three classes of materials were studied: (1) old newspapers, papers from old books and old manuscripts, all of known age; (2) newly-made commercial book, writing, manifold and index papers, and photographic film such as used for motion pictures; (3) experimental book and writing papers made in the Bureau mill from all of the fibrous materials commonly used at the time (cotton rags, wood fibers highly purified by special chemical processes, and the ordinary grades of bleached chemical wood fibers).

The old manuscripts tested were from the Orient where papermaking started, and were centuries old, some dating back to the 5th century. They were composed of cotton or similar high grade fibers of high chemical purity, and nearly all were in excellent condition. The papers of over 300 old books and newspapers were examined. All of the papers composed of rag fibers, chemically treated, 57 to 103 years old, were in good condition. Twenty-three per cent of papers consisting of chemically-treated straw or mixtures of rag, straw and wood fibers, 53 to 63 years old, were in poor condition. Some of the papers that were in good condition were composed wholly or largely of straw or wood fibers, denoting that fibers from these sources may have good life if properly treated. Contrasted with the generally good condition of the papers containing only chemically-treated fibers, 78 per cent of the papers containing crude groundwood fibers, 33 to 64 years old, were in poor condition *(149)*. Similar findings were obtained for the book papers *(134)*. These findings revealed the importance of chemical purity of fibers for good stability.

To find how the components of the newly-made papers would probably affect their stability, an improved accelerated aging test was developed and used. This consists in heating the papers for 72 hours at 100 C., and finding the decrease in strength and alpha-cellulose, and increase in copper number *(130, 131)*. Tests of papers which had been stored under normal storage conditions showed good correlation with the accelerated aging tests. *(132, 143)*. This work yielded results that confirmed the findings obtained with the tests of the old naturally-aged papers: (1) purity of the cellulose of the paper fibers is the basic factor in the stability of the papers and (2) fibers from low-grade fibrous materials, if properly purified by chemical treatment, have good stability. The latter was exemplified by the highly-purified wood fiber papers which had stability commensurate with those made from high-grade cotton fibers having a high degree of initial chemical purity. The sizing and filling materials in the papers did not affect their stability, but too high acidity resulting from the use of too much alum in the sizing processes had a very deleterious effect on the stability of the papers *(125, 128, 129, 133, 136, 137, 140)*. These studies resulted in recommended standards for permanent record papers, defining the purity of the cellulose in terms of alpha-cellulose content and copper number, and the maximum acidity considered permissible. These standards have been incorporated in the U. S. Federal Specifications for permanent record papers *(126, 128.)*

The copying of records in miniature on photographic films has become an extensive practice because great conservation of storage space is possible. At the Bureau of the Census, for example, records, formerly occupying 7000 square feet of storage space on cards, now require only 50 square feet on film. Tests have been made of the stability of the various types of films available. Acetate film was found to be very stable and is considered suitable for permanent records *(138, 139)*. Nitrate film is of little value for record purposes because of its flammability and instability. Viscose film is in an intermediate class and appears to be suitable for records requiring moderate

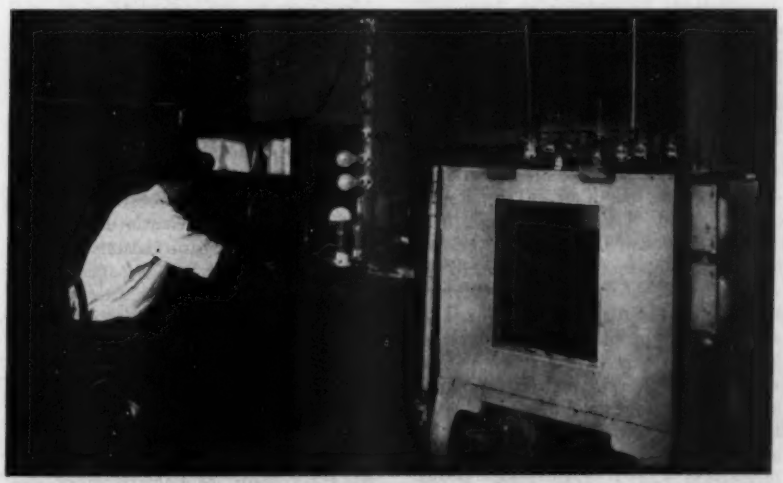


Fig. 7—Apparatus for exposing paper to air containing sulphur dioxide. Rubber gauntlets allow enclosed manipulation of test specimens in the cabinet

Fig. 8—Apparatus for studying the effect of light on paper. The irradiation chamber, on the right, was devised for accurate control of the temperature of the paper and surrounding atmospheric conditions

longevity *(142)*. The Bureau issued standard specifications, based on the results of this investigation, for permanent record and temporary record photographic microcopying films. These are the emulsion type with acetate base. By an Act of the Congress, certain Government records contained on paper may be destroyed if the records are photographed on films conforming to the Bureau's standards.

(b) Preservative Measures

A survey of storage conditions in 13 libraries, well scattered geographically and situated in both city and country areas, showed that the paper of many valuable publications was badly deteriorated. In addition to deterioration of paper of poor quality, acidic pollution of the surrounding air, light, and adverse conditions of temperature and humidity appeared to be deteriorative factors *(146)*.

Tests of paper from identical books stored in city and country libraries disclosed that paper from the books stored in city libraries was uniformly more deteriorated than paper from the books kept in country libraries *(134)*. As the paper of books from the city libraries had a high acid content and showed the type of chemical deterioration of fiber that occurs when papers are exposed to air containing small amounts of sulphur dioxide gas, this fuel-combustion product was indicated as the main cause of the greater deterioration *(147)*. Tests made at the Folger Shakespeare Library (Washington), which has an air-conditioning system, proved that chemical treatment of the water in the system could completely remove sulphur dioxide from the library air (Figure 7) at small expense *(148)*.

Exposure of record papers to carbon arc light, which simulates direct sunlight, showed that the papers were greatly weakened after 100 hours exposure. The effect of light was greatly diminished, however, when the papers were exposed to carbon-arc light modified so that it simulated diffused indirect daylight transmitted by window glass or tungsten incandescent-lamp light to which the papers are normally subjected. Although all grades of papers were adversely affected, those with the most highly-refined fibers were affected the least *(145)*.

The temperature and humidity of library air are important considerations. Paper dried out by hot, dry air becomes brittle, and in this condition the pages of books may break when handled. Likewise, adhesives used in books are brittle when too dry. Paper and the other organic materials used in books are subject to damage by mildew if they are exposed to air of high humidity. The Bureau has recommended that libraries be air conditioned for maintenance of a relative humidity of around 50 per cent and a temperature of not more than 80 Fahr. *(152)*. These conditions are favorable for the preservation of record materials and for the comfort of human beings and have now become standard practice for libraries and museums. At the time the survey of libraries was made, none was air conditioned. Since then, air conditioning equipment has been installed in many old libraries and is generally included in the planning of new libraries wherein important documentary material is to be stored.

Photographic films, like paper, are hygroscopic, and their moisture content varies with changes in the humidity of air to which they are exposed. Cellulose acetate film becomes brittle when too dry, so that control of its moisture content is desirable. The atmospheric conditions suggested for library storage of books and records are also recommended for this type of film. Where air conditioning is not available, satisfactory results can be obtained by storage in cabinets humidified by salt solutions. For the storage of the perishable and highly combustible nitrate film, fireproofed cabinets, kept at low temperature and humidity to retard deterioration *(151)*, are recommended (Figure 8).

Various sheet materials are used to mend broken documents and to protect them from further damage of this kind, and are applied to fragile documents or weak papers such as newsprint to lend them strength. The material most extensively used in the past was a coarsely-woven silk fabric called "crepeline" and, in recent years, thin, tough Japanese tissue paper came into extensive use. Both of these are affixed with starch. Experiments at the Bureau showed that cellulose acetate sheeting has several advantages for the purposes, particularly for large-scale operations, and it is used at the National Archives, the Library of Congress, and in many other archives and libraries. The sheeting is thermoplastic and therefore can be pressed on and into paper by heat and pressure, thus greatly simplifying the application process. It also has the advantages of causing practically no increase in bulk of papers, and is of high transparency. Accelerated aging tests indicated that cellulose acetate sheeting, made particularly for this purpose, was suitable for use on permanent records *(154)*.

That writing ink is deteriorative to paper is well known, and instances have been observed where the ink has eaten through the paper of old documents. The effect of inks on various grades of writing papers was found by drawing lines with the inks on one-half of sheets of the papers, heating the papers, and finding the loss in folding endurance of the inked and uninked portions. The usual acid type of commercial ink and a noncommercial alkaline type, prepared with ammonia according to a formula developed by

other investigators, were used. Under the heat test, the inked portions of the papers containing the acid inks lost from 13 to 50 per cent more of their initial folding endurance than the uninked portions. The alkaline ink caused practically no loss of folding endurance. This ink is now used by the Federal Government Departments *(135)*.

Documentary material which has been improperly stored often contains destructive insects which are killed in fumigation chambers. Representative book and writing papers were fumigated with several widely-used fumigants and the effect on the papers was determined *(150)*.

Summary reports of the studies relating to the preservation of records contained on paper *(152)* and on photographic films *(144)* have been issued.

5. Properties and Specifications

Studies to assist in the development of quality specifications are made in co-operation with Federal Government Agencies and such organizations as trade associations and technical societies. This work involves testing of the commercial products and in most instances development of special testing methods and devices suited to specific products.

A large part of this work is in connection with the Federal Specifications which cover commodities used by the Federal Government. Assistance is given in their development, not only by investigative work, but also by service on technical committees which prepare the specifications. Members of the Bureau staff have assisted in the development of the present 88 specifications for paper and related products and are assisting in the development of additional ones. Their use for purchase of Government supplies has resulted in large economies, and the specifications are also used extensively by the public.

(a) Fibrous Building Materials

Considerable study has been made of the properties and performance of fibrous building materials, with the assistance of personnel supported by the Insulation Board Institute and the Federal Housing Agency. The latter is interested in such information relative to its low-cost housing program. Data were obtained on the insulating value, flexural properties, water absorption, water permeability, linear expansion, and nail-holding ability of fiber insulating boards *(155, 157, 162)*. Cycles of wetting, freezing, drying and baking were devised to find how well they retained their desirable properties under these accelerated aging conditions *(160, 164)*. Similar studies were made of fiber sheathing board *(165)* and sheathing papers *(156, 163)*.

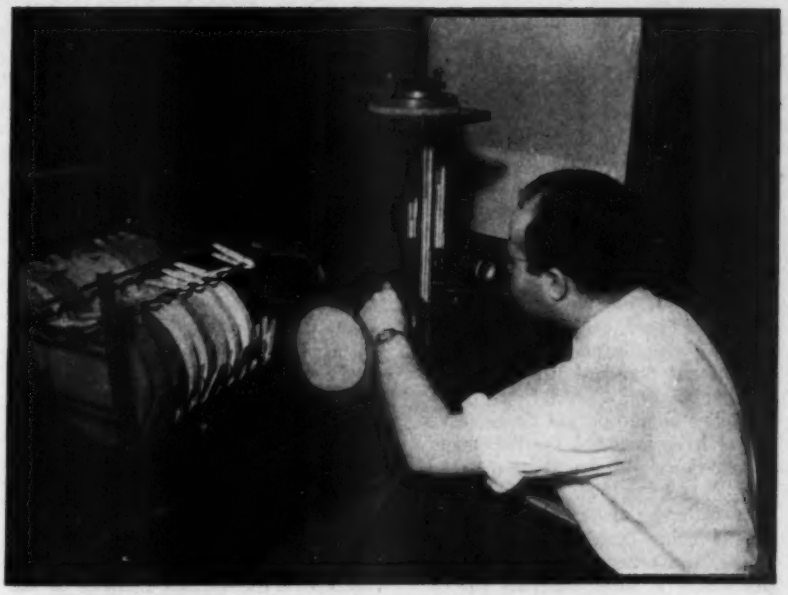


Fig. 9—Testing the air permeability of fiber insulating board with precise apparatus developed in the Paper Section

In a related study of fiber tile boards, which are coated with a synthetic plastic simulating ceramic wall tile, data were obtained on the resistance of the coating to impact, abrasion by scouring powders, staining agents, and steam *(166)*. Studies have also been made of the weathering properties of roofing felts and numeral-surfaced asphalt shingles as influenced by their components *(158, 159, 161)*. Data also have been obtained on the accumulation of moisture in walls of structures *(167, 169)* relative to fibrous materials used in the walls (Figure 9).

(b) General

It became necessary during World War II to find what critical packaging materials could be dispensed with, to develop paper substitutes for the critical products, and to develop new or improved Federal Specifications and testing methods for better performance of the materials. The objectives were gained in co-operative work with the war agencies and manufacturers. Extensive tests of asphalted wrapping papers resulted in an improved Federal Specification for papers to be used for general packaging purposes and in a recommended specification for papers for lining shipping cases *(188)*. Information was also obtained on the deterioration of caselining papers caused by mildewing when exposed to tropical conditions of temperature and humidity *(190)*. The greatly increased use of paper shipping sacks brought about by the necessity for conservation of metal, wood and textile containers necessitated the development of a Federal Specification. This was the first comprehensive standardization of such sacks. Through co-operative testing with manufacturers, substitutes were developed for the critical cloth, metal, and abaca manila hemp fibers used in the manufacture of shipping tags. Paper tags with greatly increased durability through use of melamine resin served as satisfactory substitute for cloth and metal tags *(189)*.

Other standards of quality suitable for use in specifications were developed by investigative work on paper towels, Braille papers, filter papers, and binders board. Some grades of paper towels lost their initial absorptiveness to water to such an extent that within a normal storage period of six months they were unsatisfactory for use. A test made by heating towels was found suitable for foretelling their quality in this respect *(179)*.

A study of Braille papers used in printing for blind readers resulted in a specification used by the Library of Congress for purchase of such paper. The requirements of the paper are severe because it must permit the embossing of raised dots strong enough to resist deformation under the reader's fingers, and free from surface cracks or other harshness that might be irritating to the sensitive touch of the blind reader *(178)*.

Despite the importance of analytical filter papers as a tool of the chemist, there were no adequate standards of quality for them. Improved testing methods for retention of fine precipitates, time of flow of water, ash, and

wet strength of the filter papers were developed *(186, 187)*.

The adverse effect of degraded cellulose and acidity on the stability of the papers and errors in analytical determination caused by degraded cellulose were also demonstrated. Suggested standards, taking into account all of the properties mentioned, were evolved, based on test data for all of the domestic and foreign papers available *(191)*.

A study of the physical properties of binders board, made in co-operation with the manufacturers, resulted in a Commercial Standard for this important bookbinding material *(177)*.

Studies on the optical properties of papers have included the dependence of reflectance and opacity on the thickness *(180)*, optical specification of light-scattering materials *(181)*, systematic color designations for paper *(182)*, and reflection-transmission relationships in sheet materials *(185)*.

The Bureau acts as a co-ordinating fact-finding agency to assist industry in the development of Commercial Standards and Simplified Practice Recommendations. The first are technical standards of quality and the second deal with simplification of sizes and types of products to eliminate waste caused by superfluous variety of products. Both are voluntary standards developed through concerted action of producers, distributors and consumers. A list of the Bureau publications containing such standards, which include many paper products, can be obtained on application to the Bureau.

The National Directory of Commodity Specifications and the Supplement issued by the Bureau list and describe the standard testing methods and the specifications of trade associations, technical societies, and other organizations that are representative in a national way of industry, as well as the standard testing methods and specifications of the various agencies of the Federal Government *(193)*.

Bibliography of NBS Publications

Publications are listed in this section grouped in chronological order under the same headings as those of the text. The reports of the investigations are published either in government publications or in outside publications. Copies of the publications can be consulted in many of the larger libraries.

Where the price is stated, the publication can be purchased from the Superintendent of Documents, Government Printing Office, Washington 25, D. C. The prices quoted are for delivery to addresses in the United States and its territories and possessions and in certain foreign countries which extend the franking privilege. Remittances should be made either by coupons (obtainable from the Superintendent of Documents in sets of 20 for $1.00 and good until used), or by check or money order payable to the "Superintendent of Documents, Government Printing Office" and sent to him with order. Articles marked "OP" are out of print and reprints are no longer available.

4. Preservation of Records

(a) Permanency of Record Materials

125) A study of purified wood fibers as a papermaking material, R. H. Rasch. *BS J. Research* 3, 469 (1929) RP107, OP.

126) Permanence standards for printing and writing papers, B. W. Scribner. *Transactions of the A.S.M.E.* 52, No. 19 (Aug. 1930).

127) Light sensitivity of rosin paper-sizing material, A. E. Kimberly and J. F. G. Hicks. *BS J. Research* 6, 819 (1931) RP307, 5¢.

128) Permanence studies of current commercial book papers, J. O. Burton. *BS J. Research* 7, 429 (1931) RP349, 5¢.

129) Highly purified wood fibers as a papermaking material, R. H. Rasch, M. B. Shaw and G. W. Bicking. *BS J. Research* 7, 765 (1931) RP372, OP.

130) Accelerated aging test for paper. R. H. Rasch. *BS J. Research* 7, 466 (1931) RP352, 10¢.

131) Estimating the stability of paper by heating, R. H. Rasch and G. O. Stone. *Paper Trade J.* 95, No. 4, 28 (July 28, 1932).

132) Comparison of natural aging with accelerated aging, R. H. Rasch and B. W. Scribner. *BS J. Research* 11, 727 (1933) RP620, 5¢.

133) A study of some factors influencing the strength and stability of experimental papers made from two different sulphite pulps, R. H. Rasch, M. B. Shaw and G. W. Bicking. *BS J. Research* 11, 7 (1933) RP574 5¢.

134) A study of the deterioration of book papers in libraries, A. E. Kimberly and A. L. Emley. Misc. Pub. BS M140 (1933), 5¢.

135) Relation of ink to the preservation of written records, E. W. Zimmerman, C. G. Weber and A. E. Kimberly. *J. Research NBS* 14, 463 (1935) RP779, 5¢.

136) A study of the relation of some properties of some cotton rags to the strength and stability of experimental papers made from them, M. B. Shaw, G. W. Bicking and M. J. O'Leary. *J. Research NBS* 14, 649 (1935) RP794, 10¢.

137) Study of the effect of fiber components on the stability of book papers, M. B. Shaw and M. J. O'Leary. *J. Research NBS* 17, 859 (1936) RP949, 5¢.

138) Stability of motion-picture films as determined by accelerated aging, J. R. Hill and C. G. Weber. *J. Research NBS* 17, 871 (1936) RP950, 5¢.

139) Evaluation of motion-picture film for permanent records, J. R. Hill and C. G. Weber. Misc. Pub. NBS M158 (1937), 5¢.

140) Effect of filling and sizing materials on stability of book papers, M. B. Shaw and M. J. O'Leary. *J. Research* NBS 21, 671 (1938) RP1149, 10¢.

141) The evaluation of motion-picture films by semimicro testing, J. E. Gibson and C. G. Weber. *J. Documentary Reproduction* 1, No. 3 (1938).

142) Stability of the viscose type of Ozaphane photographic film, A. M. Sookne and C. G. Weber. *J. Research NBS* 21, 347 (1938) RP1134, 5¢.

143) A comparison of accelerated aging of record papers with normal aging for eight years, B. W. Scribner. *J. Research NBS* 23, No. 3, 405 (1939) RP1241, 5¢.

144) Summary report of research at the National Bureau of Standards on the stability and preservation of records on photographic film, B. W. Scribner. Misc. Pub. NBS M162 (1939), 10¢.

145) Photochemical stability of papers, H. F. Launer and W. K. Wilson. *BS J. Research* 30, 55 (1942) RP1517, 5¢.

(b) Preservative Measures

146) A survey of storage conditions in libraries relative to the preservation of records, A. E. Kimberly and J. F. G. Hicks. Misc. Pub. BS, M128 (1931), OP.

147) Deteriorative effect of sulphur dioxide upon paper in an atmosphere of constant humidity and temperature, A. E. Kimberly. *BS J. Research* 8, 159 (1932) RP407, 5¢.

148) A study of the removal of sulphur dioxide from library air, A. E. Kimberly and A. L. Emley. Misc. Pub. BS M142 (1933), 5¢.

149) Preservation of newspaper records, B. W. Scribner. Misc. Pub. NBS M145 (1934), 5¢.

150) Effects of fumigants on paper, C. G. Weber, M. B. Shaw and E. A. Back. *J. Research NBS* 15, 271 (1935) RP828, 5¢.

151) Care of filmslides and motion-picture films in libraries, C. G. Weber and J. R. Hill. *J. Research NBS* 17, 753 (1936) RP942, 5¢.

152) Summary report of Bureau of Standards research on preservation of records, A. E. Kimberly and B. W. Scribner. Misc. Pub. NBS M154 (1937), 10¢.

153) Air treatment for preservation of records in libraries, B. W. Scribner. *Refrigerating Eng.* 33, No. 4 (April 1937).

154) The protection of documents with celluluse acetate sheeting, B. W. Scribner. Misc. Pub. NBS M168 (1940), 5¢.

5. Properties and Specifications

(a) Fibrous Building Materials

155) Properties of fiber building boards, C. G. Weber, F. T. Carson and L. W. Snyder. Misc. Pub. BSM 132 (1931), OP.

156) A study of sheathing papers, F. T. Carson and F. V. Worthington. *BS J. Research* 3, 75 (1929) RP85, OP.

157) Study of fiber wall boards for developing specification standards, B. W. Scribner and F. T. Carson. *Paper Trade J.* 89, No. 13, 61 (Sept. 26, 1929).

158) A study of the weathering quality of roofing felts made from various fibers, O. G. Strieter. *J. Research NBS* 16, 511 (1936) RP888, OP.

159) Accelerated weathering tests of mineral-surfaced asphalt shingles, H. R. Snoke and B. E. Gallup. *J. Research NBS* 18, 669 (1937) RP1002, 10¢.

160) The accelerated aging of fiber building boards, D. A. Jessup, S. G. Weissberg and C. G. Weber. Building Materials and Structures Report BMS4 (Oct. 11, 1938), 10¢.

161) Weathering tests of filled coating asphalts, O. G. Strieter. *J. Research NBS* 20, 159 (1938) RP1073, 10¢.

162) Properties of some fiber building boards of current manufacture, C. G. Weber and S. G. Weissberg. Building Materials and Structures Report BMS13 (Feb. 23, 1939), 10¢.

163) Stability of sheathing papers as determined by accelerated aging, S. G. Weissberg, D. A. Jessup, and C. G. Weber. Building Materials and Structures Report BMS35 (Dec. 22, 1939), 10¢.

164) Stability of fiber building boards as determined by accelerated aging, D. A. Jessup, C. G. Weber, and S. G. Weissberg. Building Materials and Structures Report BMS50 (May 13, 1940), 10¢.

165) Stability of fiber sheathing boards as determined by accelerated aging, D. A. Jessup, C. G. Weber and S. G. Weissberg. Building Materials and Structures Report BMS69 (Jan. 22, 1941), 10¢.

166) Properties and performance of fiber tile boards, D. A. Jessup, H. Bogaty and S. G. Weissberg. Building Materials and Structures Report BMS77 (Aug. 8, 1941), 10¢.

167) Accumulation of moisture in walls of frame construction during winter exposure, C. G. Weber and R. C. Reichel. Building Materials and Structures Report BMS93 (November 4, 1942), 10¢.

168) Experimental dry-wall construction with fiber insulating board, C. G. Weber and R. C. Reichel. Building Materials and Structures Report BMS97 (May 7, 1943), 10¢.

169) Laboratory observations on condensation in wall specimens, R. S. Dill and H. V. Cottony. Building Materials and Structures Report BMS106 (Aug. 2, 1946), OP.

(b) General

170) The standardization of paper, F. A. Curtis. *Paper Trade J.* 73, No. 17, 28 (Oct. 27, 1921), OP.

171) Report on simplification of paper sizes, Committee on Simplification of Paper Sizes. *Paper Trade J.* 75, No. 19, 36 (Nov. 9, 1922), OP.

172) Report of the committee on the simplification of paper sizes and other data, Committee on Simplification of Paper Sizes. Booklet published by the Committee (Sept. 1923), OP.

173) Study of the windows of window envelopes for the purpose of developing standard specifications, R. E. Lofton. *Tech. Pap. BS* 21, 385 (1926-27) T343, 5¢.

174) The spotting of plated and finished metals, W. P. Barrows. *BS J. Research* 2, 1085 (1929) RP72, 10¢.

175) Envelope paper qualities and their determination, B. W. Scribner. *Envelope Industry* 2, No. 10; 3, No. 1 (Dec. 1928; March 1929), OP.

176) Mechanism of heat flow in fibrous materials, J. L. Finck. *BS J. Research* 5, 973 (1930) RP248, OP.

177) A study of the physical properties of binders board, B. W. Scribner and L. W. Snyder. *Paper Trade J.* 95, No. 16, 29 (Oct. 20, 1932).

178) Properties of white Braille papers for Library of Congress publications, C. G. Weber. *BS J. Research* 12, 811 (1934) RP690, 5¢.

179) Standards for paper towels, B. W. Scribner and R. W. Carr. Circ. NBS C407, (1935), 5¢.

180) The dependence of reflectance and opacity on thickness; relation between contrast radio and printing quality, D. B. Judd. Tech. Assoc. Papers, Series XVIII, No. 1, 441 (1935).

181) Optical specification of light-scattering materials, D. B. Judd. *J. Research NBS* 19, 287 (1937) RP1026, 10¢.

182) Systematic color designations for paper, D. B. Judd. *Paper Trade J.*, Tech. Sec. 111, 201 (1940).

183) Inks, C. E. Waters. Circ. NBS C426 (Aug. 7, 1940), 15¢.

184) Typewriter ribbons and carbon paper, C. E. Waters. Circ. NBS C431 (June 14, 1941), 10¢.

185) Reflection-transmission relationships in sheet materials, H. F. Launer. *J. Research NBS* 27, 429 (Nov. 1941) RP1430, 5¢.

186) Measurement of rate of flow of water through filter paper, H. Bogaty and F. T. Carson. *J. Research NBS* 33, 353 (Nov. 1944) RP1613, 5¢.

187) Methods for the evaluation of analytical filter papers, B. W. Scribner and W. K. Wilson. *J Research NBS* 34, 453 (May 1945) RP1653, 5¢.

188) Development of standards for flexible caselining materials, B. W. Scribner, F. T. Carson and C. G. Weber. Misc. Pub. NBS M182 (1946), 10¢. Also published as Standards for caseliners, *Modern Packaging* 19, No. 8 (April 1946); No. 9 (May 1946).

189) Improving peacetime packages, B. W. Scribner. *Domestic Commerce* 34, No. 6, 14 (June 1946), 10¢.

190) Effect of mildew on caselining materials, B. W. Scribner and E. Abrams. *Paper Trade Journal* 123 No. 15, 132 (Oct. 10, 1946).

191) Development of standards for analytical filter papers, B. W. Scribner and W. K. Wilson. *J. Research NBS* 39, 21 (1947) RP1809, 10¢.

192) National directory of commodity specifications, Prepared by P. A. Cooley and A. E. Rapuzzi under the direction of A. S. McAllister. Misc. Pub. NBS M178 (1945), $4.00.

193) Supplement to national directory of commodity specifications, Prepared by P. A. Cooley under the direction of G. N. Thompson. (1947), $2.25.

Part II concludes this article. The first part was published in the June issue of this magazine.

Magnetic Drives for Paper Mills

(Continued from page 576)

2. To manufacture good paper, it is necessary that the spouting velocity of the stock in the head box be equal to the speed of the screen. This necessitates precise control of the head, and, in turn, the amount of stock pumped by the fan pump.

Controlling flow by throttling the discharge is not desirable, for this results in a sudden decrease of pressure at the discharge valve and in an increase in size of bubbles of entrained air. This may even result in holes in the paper.

A Magnetic Drive, with Regutron control, installed at #2 between a constant speed motor and the fan pump, provides an ideal solution to this problem.

The potentiometer "P" (referring to Figure 7) controls the actual pump speed. It is positioned by a reversible D.C. operated motor turning one direction to raise speed and the other to decrease it. One paper manufacturing company has supplied a floating motor operated contact device which controls the direction of rotation of the potentiometer positioning motor. This device is positioned by pressure and thus is responsive to the level of stock in the head box. If the level is correct, the rotating contact makes no electrical circuit.

If the head falls slightly the contact device will make four to twenty-four contacts per minute, depending on how far the head deviates from the desired value. The circuit established causes

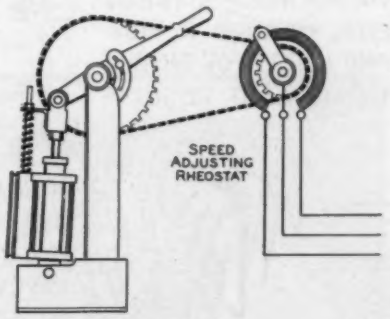


Figure 10

the potentiometer motor to "inch" in the direction causing an increase in pump speed.

For too high speed the operation is the reverse of this.

It is expected that this type of control will maintain the desired level within ± ¼ in. over the entire operating range.

3. The black liquor coming from the washer is nearly all water. Most of this water is removed in the evaporator, leaving largely lignin, resin and sodium sulphate. This residue is burned under the boiler to provide electric power. The residue is extremely viscuous and it is difficult to accurately control the flow. A constant speed motor and a Magnetic Drive at #3 in this diagram provides the control means. The speed control may be operated manually or it may be tied in with the combustion control system if desired.

4. Boiler draft fans, both forced and induced, are also driven through Magnetic Drives. At #4 in the diagram, is one such installation. The speed setting potentiometer is positioned by the combustion control system. One type of combustion control actuator and its hookup to the potentiometer is shown in Figure 10.

In addition to these applications others will present themselves from time to time, where variable speeds are required. Good papermaking requires precise, easy control of many devices. The Magnetic Drive and Regutrons provide this control.

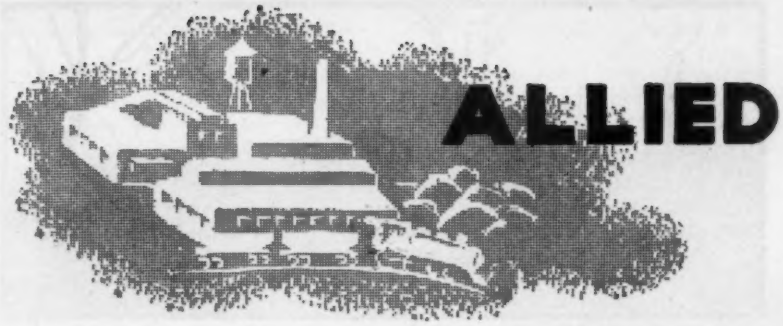
Paper SKETCHES . . . . . .

PARTS OF THE FIRST FOURDRINIER MACHINE IMPORTED FROM ENGLAND IN 1827 AND SET UP IN THE MILLS OF BEACH, HOMMERKEN & KEARNEY, SAUGERTIES, N. Y., WERE STILL IN USE FORTY-FIVE YEARS LATER!

SWEDISH EXPERIMENTERS HAVE BEEN FEEDING PAPER PULP, SUPPLEMENTED WITH MOLASSES, SOYBEAN PROTEIN OR CASEIN, AND A MINERAL MIXTURE TO HUNDREDS OF THOUSANDS OF CATTLE AND HORSES FOR THE PAST THREE YEARS—APPARENTLY WITH EXCELLENT RESULTS

IN THE EARLY DAYS OF PAPERMAKING, DECKLE EDGES WERE CONSIDERED AS BLEMISHES AND USUALLY WERE CUT OFF!

AS EARLY AS 1580, IT APPEARS, THERE WAS A PAPER MILL OPERATING AT CULHUACÁN, MEXICO. THIS WAS 110 YEARS BEFORE RITTENHOUSE ESTABLISHED THE FIRST PAPER MILL IN THIS COUNTRY.



RYERSON COMPANY HOLDS OPEN HOUSE AT ENLARGED CLEVELAND, OHIO, PLANT

Joseph T. Ryerson, Inc., Chicago, held open house at its enlarged Cleveland plant on May 21. An estimated 1,500 customers and other friends of the firm attended. Among the Ryerson executives who welcomed guests were Everett D. Graff, president, and Harold B. Ressler and Ainslie Y. Sawyer, vice presidents. William O. Springer, manager of the Cleveland plant, was host.

The company's property at 53rd and Lakeside Avenue, Cleveland, now comprises about 250,000 square feet of floor space. A spokesman stated that the plant is the largest of its kind between New York and Chicago devoted to the distribution of steel from stock. The new two-story brick and concrete addition to the plant provides 80,000 square feet of heated warehouse space and 13,000 square feet of space for new offices. New equipment includes monorail and bridge cranes, and sawing and shearing machines. Facilities for loading and dispatching steel have been considerably improved.

The Cleveland steel-service plant of the Ryerson company was established in 1927 with the acquisition of the former Bourne-Fuller company plant. It was the eighth unit in the Ryerson group of plants which now number thirteen, located across the country from coast to coast.

▼

HILTON-DAVIS UNDERTAKES $900,000 EXPANSION PLAN

Construction has started on a $900,000 expansion program at the Hilton-Davis Chemical Company at Cincinnati, Ohio. This expansion in building and equipment will increase the quantity of the items now made and add to the present production of colors, dyes, and intermediates.

The new two-story building will add 34,000 square feet of floor area to existing facilities. The H. K. Ferguson Company of Cleveland will install equipment and an extensive process piping system in the project, which is scheduled to be completed September 1.

▼

LINK-BELT LETS CONTRACT FOR NEW HOUSTON PLANT

Link-Belt Company, Chicago, has given Vivrett & Vivrett the contract for the construction of a modern new plant on a 10-acre plot of ground in the 5100 block of Wayside Drive in Houston, Texas. J. A. Pitzinger is the architect and engineer for the new plant.

Included in the project will be a one-story, all-steel factory building with three bays, and a two-story office section of masonry construction in front. The plant proper will include a modern machine shop, structural steel shop, and large warehousing facilities.

▼

E. E. ESGATE ESTABLISHES OWN FIRM OF CONSULTANTS

Ernest E. Esgate, former logging engineer for the American Pulpwood Association, has established the firm of E. E. Esgate Associates, consultants, with offices at 12 East 41st Street, New York City. The firm will specialize in methods of operation and equipment for the pulpwood industry.

Ernest Esgate

A native of the Pacific Northwest, Mr. Esgate was employed by private interests in the lumber industry and by the U. S. Forest Service in that region for several years before moving to the New England region in 1938 to assist in the salvage of hurricane-damaged timber as a production specialist. Mr. Esgate served with the Army Engineers as a civilian and as an officer from 1941 to 1947, being engaged in the development and supply of construction equipment for the Armed Forces.

As logging engineer for the American Pulpwood Association, Mr. Esgate was concerned with the development of improved methods of operation and equipment for the pulpwood industry, an activity that he will carry on as a consultant. Associates will include qualified technicians in the fields of materials handling and equipment design. The services of the firm will be available to both the pulpwood industry and the manufacturers of equipment.

▼

MONSANTO BUYS SURPLUS SYNTHETIC RUBBER PLANT

A surplus synthetic rubber plant has been purchased by Monsanto Chemical Company, St. Louis, from the War Assets Administration for $169,500. The purchase, the company said, is contingent on approval by the Department of Justice.

Located adjacent to the Monsanto Plastics Division plant in Springfield, Massachusetts, the plant was built by the company for the government dur-

Group of visitors watching shearing operation during Open House held recently at the enlarged Cleveland (Ohio) steel-service plant of Joseph T. Ryerson & Son, Inc.

ing the war. It was originally used for the production of polydichlorostyrene —a plastic material with exceptionally high electrical insulating properties. The material was used during the war for essential parts of radar equipment. Because it does not have a civilian market, manufacture was discontinued soon after the war's end.

The plant was then partially reconverted and materials for synthetic rubber were produced for the Office of Rubber Reserve. When this work was completed, Monsanto leased the plant from the government and began the manufacture of an oil additive. According to the company, manufacture of oil additives would be continued in this plant.

▼

WORK ON GOUVERNEUR TALC PLANT NEARS COMPLETION

Work on the new talc grinding plant being built by the Gouverneur Talc Company (Gouverneur, N.Y.), a subsidiary of the R. T. Vanderbilt Company of New York, is progressing and it is expected operations will begin about August 1.

The construction is being handled by the James Stewart Company. Work started last August and continued through the winter months with some 200 men now employed on the job.

The finished plant will have a capacity of 250 tons daily. Special grinding equipment will be used, and some grades will be made with a particle size of about one micron and a color brightness standard of over 90, which can be used where special whiteness is desired. One of the new features of the plant layout is the use of large cement bins or silos for storing finished products and ore in progress.

The entire manufacturing operation of the Mixing Equipment Company, Rochester, N.Y., recently was installed in this new modern plant located in the outskirts of the city

NEW PLANT OPENED BY MIXING EQUIPMENT CO.

The Mixing Equipment Company (Rochester, N.Y.) recently installed its entire manufacturing operation into a modern new plant located in the outskirts of the city.

The new plant is a one story structure equipped with two large truck docks and a railway siding, thus permitting efficient handling of incoming and outgoing shipments. Fluorescent lighting fixtures have been installed through the plant, and natural light is admitted through the walls which are constructed entirely of glass.

Materials handling is speeded by overhead traveling cranes in all bays and by the use of electric lift trucks. Power is quickly available at any point in the plant through the use of bus bar wiring. Electrical connections can be made quickly and easily and conduits are eliminated. The latest machine tools, jigs, and inspection equipment were installed and no old machine tools are being used.

The manufacturing layout was entirely the work of Mixing Equipment engineers under the direction of Lee Brown, factory superintendent, Richard Boutros, chief engineer, and Milton S. Dykman, assistant chief engineer. The former plant will be used exclusively for research and engineering. To broaden the scope of its research program, Edwin L. Lowthian has been added to the staff as senior process engineer.

▼

BOWSER, INC., ADDS LINE OF CENTRIFUGAL PUMPS

Centrifugal pumps with a wide range of capacities and heads have been added by Bowser, Inc., Fort Wayne, Indiana, to its line of liquid control equipment for the handling of most liquids.

Single and two-stage units ranging from ¼ to 75 hp. and from 10 to 2500 gpm—including self-priming types—are suitable for a variety of applications and for viscosities up to 8000 S.S.U.

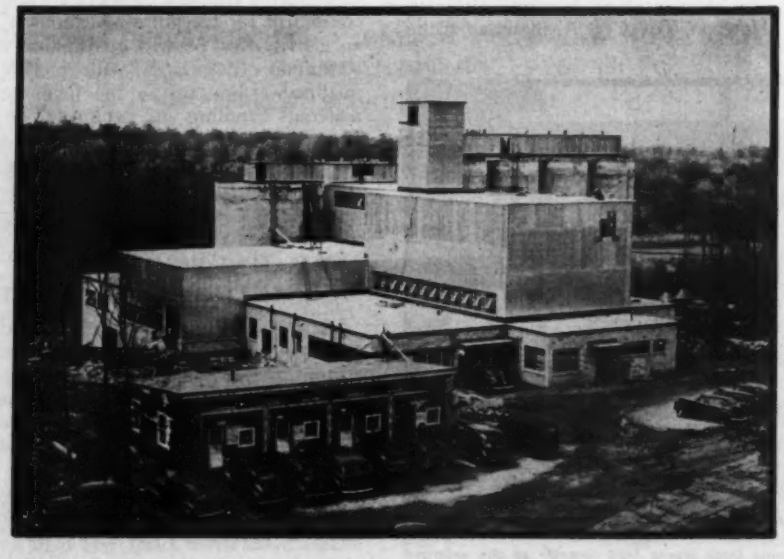
Four models are available: (1) close-coupled with common shaft—two feet under pump and two under motor; (2) close-coupled with pump mounted on extended motor shaft and pump adapter—four feet under motor; (3) pump mounted on base plate, with or without motor and flexible coupling; and (4) self-priming pump mounted on base plate, with or without motor and flexible coupling.

▼

LUKENS STEEL OBSERVES ITS 138th ANNIVERSARY

The Lukens Steel Company on July 2 observed the 138th anniversary of the continuous making of iron and steel on the banks of historic Brandywine Creek, in Coatesville, Pennsylvania, under a continuous line of family ownership and management.

Three descendants of Isaac Pennock, of the "founding family," are still active in Lukens management, serving as officers and directors. They are Charles Lukens Huston, first vice president, Charles Lukens Huston, Jr., vice presi-



New plant of Gouverneur Talc Company, Gouverneur (N.Y.), a subsidiary of R. T. Vanderbilt Company

dent and executive assistant to the president, and Stewart Huston, secretary.

Charles Lukens Huston, a pioneer steelmaker, celebrated his 92nd birthday on July 8 by working as usual as he had done for more than the 72 years since he joined the company as a clerk in 1875. A contemporary of Andrew Carnegie, John Fritz, and Charles M. Schwab in the early days of the iron and steel business in this nation, Mr. Huston has played an important part in the development of the steel industry. A patentee of several highly-regarded inventions used in the manufacture of steel, he planned and designed Lukens' four-high 206-inch mill—the world's largest plate mill

▼

"Contract Unique"

▶▶▶ THE STORY OF a job so outstanding in its size and scope that it was christened "Contract Unique" has been published in a book given that title by Downingtown Manufacturing Company, Downingtown, Pennsylvania.

The company has designed this book to commemorate its "Contract Unique" with the United States Gypsum Company. Its purpose is best described by the following quotation from the flyleaf:

"In appreciation of the friendly cooperation given us, which made this gigantic undertaking a real pleasure, we of the Downingtown Manufacturing Company dedicate this book to those of the United States Gypsum Company with whom we associated, and to our sub-contractors, who helped us keep our promises."

The Book Unique had its beginning back in 1945 about the time "Contract Unique" was negotiated. The Contract is briefed on one page from the book:

"On November 29, 1945, the Downingtown Manufacturing Company signed a contract with the United States Gypsum Company. For over a year, the United States Gypsum Company had analyzed its requirements for paper and felt, together with various designs and locations of mills and as a result of this study, they decided to install combination mills in California and New Jersey.

"We would design and build two High Capacity, Combination Felt and Liner Board Machines and furnish all of the Stock Preparation Equipment for the two complete mills. They would be responsible for the power plant, buildings and accessories.

"This was 'Contract Unique' in the paper industry because of its size . . . and because of its scope . . . complete manufacturing equipment from raw material to finished product in two mills. It was 'Contract Unique' in responsibility.

"We and our sub-contractors delivered this equipment on schedule, despite the harassing strikes in steel, coal, copper and numerous other industries, under the able leadership of our former president, Edward T. Street." (Signed) *Enright A. Ellis, President Downingtown Manufacturing Co.*

The inside pages of this book were printed by Beck Gravure, the cover by letter press and embossed. It was planned, written and designed by Eugene A. Holland (industrial and technical advertising), Philadelphia, who has handled the Downingtown advertising for more than 20 years.

This de luxe volume is an elaborate, plastic bound book with a stiff cover, 11 by 14 inches. It contains 28 pages plus two 6-page open-out sheets, laminated with cellophane on both sides. As these pages are opened, each bears a statement emphasizing the gigantic size of this contract: (1) 182 Freight Carloads, (2) 3948 tons of Equipment, (3) 105 tons of Brass, Bronze and Copper, (4) 2950 tons of Cast Iron, (5) 73 tons of Stainless Steel, and (6) 37 tons of Rubber.

When both of these pages are opened, left and right, the 84-inch spread contains a side elevation of the 10-vat machine with 124 dryers at Clark, New Jersey, with a note that the machine at South Gate, California, is identical in every respect, except that it has 8 vats and 91 dryers.

The photographs reproduced in the book are all large, showing views of the machine at South Gate, California, and other equipment furnished by Downingtown Manufacturing Company. The fly leaves at the front and back of the book contain reproductions of pencil drawings of the exteriors of both mills. The book was enclosed in a silver paper covered slip case and mailed in a special box.

▶▶▶ THE OCCUPANCY OF new executive and sales offices, consisting of the entire 18th floor at 370 Lexington Avenue, New York City, has been announced by Hewitt-Robins, Inc., manufacturer of rubber products and materials handling equipment. In addition to being executive offices, the new location will serve as eastern sales offices for the Hewitt Rubber and Restfoam Divisions, Buffalo, New York, and Robins Conveyors and Engineers Divisions located at Passaic, New Jersey, and New York City. Hewitt-Robins executive offices were located formerly at 70 Pine Street, New York City.

▼

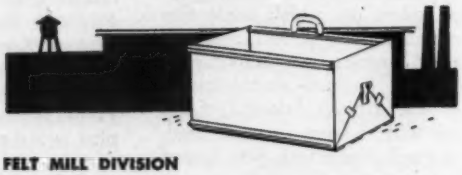
NEW FOLDER ILLUSTRATES FIBER-PRODUCTS LAB.

The Fiber-Products Laboratory located in Springfield, Ohio, is pictured and described in a new folder which may be obtained from any of the six sponsoring companies or direct from the laboratory.

This unique laboratory is equipped with machinery of commercial size to perform the operations of chipping, cooking, refining, sheet forming, and drying. Thus actual manufacturing processes can be carried on, from the chipping of cord wood and other materials to the production of finished sheets. Complete chemical and phys-

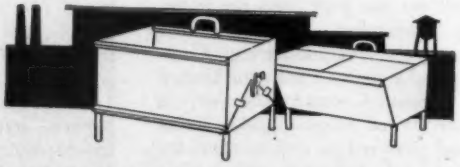
THIS TRUCK HAS 37 BODIES - - -

. . . HANDLE CAR LOADS



FELT MILL DIVISION

Produces 30 cu. yds. of scrap and clean-up per day. Two, 6 cu. yds. Heavy Duty Drop Bottom Bodies are used.



ROOFING MILL AND MACHINE DIVISION

Produces 104-1/2 cu. yds. of tabs, shingle scrap, slate scrap and roofing scrap per day. Seventeen, 5 cu. yds. Drop Bottom Bodies on legs and two, 2 cu. yds. Water-Tight Tilt Type Bodies on legs are used.

Shown at right are 4 standard types of Dempster-Dumpster bodies. Many variations are available to make these bodies meet every materials handling requirement. Sizes range from 1-1/2 to 20 cu. yds. capacities. A Dempster-Dumpster engineering survey, without obligation to you, will doubtless show tremendous savings for your plant. Write or wire us now.

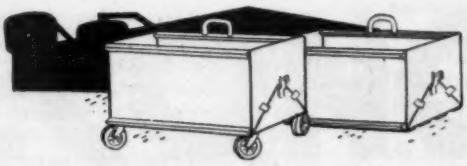
220 CUBIC YARDS—4 RAILROAD CARS OF WASTE AND SCRAP DAILY—

HERE IS A TYPICAL EXAMPLE OF LOW COST DEMPSTER-DUMPSTER MATERIALS HANDLING IN INDUSTRIAL PLANTS. IN THIS CASE, IN A LARGE ROOFING PLANT.

In one of the nation's largest roofing plants, collection and removal of waste and scrap had developed into an expensive problem. Approximately 220 cu. yds. —about 4 railroad car loads—of every type of waste . . . heavy, light, bulky, moist and dry, had to be collected daily from many points in this widespread plant . . . some in driblets, some in large volume. A more flexible, less expensive system of collection was vital.

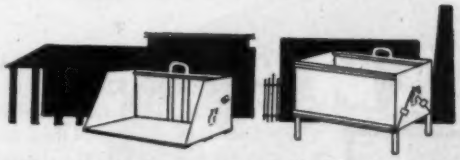
A Dempster Engineering Survey showed how one Dempster-Dumpster Hoisting Unit on truck, serving 37 detachable bodies of various types could collect and dump the plant's entire daily scrap output in only eight hours. As a result of this comprehensive survey, Dempster-Dumpster system was put to work. Spotting the bodies at predetermined accumulation points throughout the plant, the truck hoisting unit and one man, the driver, hydraulically pick up each body as it is filled . . . haul it . . . dump it and return it for reloading (as illustrated at extreme left). The different types of bodies were ordered for most effective materials handled . . . heavy duty bodies for heavy slate scrap . . . light bodies for light bulky felt scrap. Bodies on casters, pushed right up to the machine to receive scrap, eliminated wheelbarrow and hand carrying. At another point bodies are carried in and out of the building by the plant's power driven platform-lift trucks. Scrap collection in this plant is now made on an efficient time-table basis. Savings, over the original cost of handling waste and scrap, have paid for the entire installation in almost 12 months. In many other installations in less time.

Here is how the Dempster-Dumpster System serves all plant sections simultaneously. Replacing an obsolete system of truck-drawn hard wheel trailers, clumsy bins, wheelbarrow handling and hours of useless clean-up time, this installation comprises one truck hoisting unit and 37 bodies in 7 different types. Bodies receive the scrap as it accumulates. When a body is filled, it is picked up by the truck hoisting unit, carried to the disposal area, dumped and returned for refilling. Seven main plant sections are served by the truck hoisting unit, as shown below. Amount of scrap produced and body used is also shown.



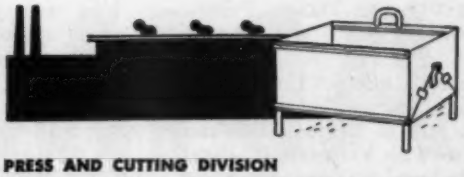
HYDRO-PULPER DIVISION

Produces 28 cu. yds. of scrap per day. One, 6 cu. yds. Heavy Duty Drop Bottom Body and four, 6 cu. yds. Drop Bottom Bodies on casters are used.



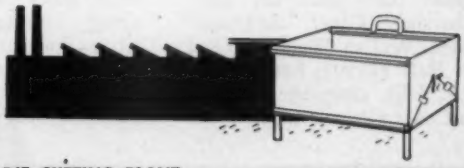
LOADING DOCK AND POWER HOUSE

Produce varying amounts of waste, debris and waste coating in drums. For loading Dock, one 2-1/2 cu. yds. Skip Type Body. For Power House, one, 2-1/2 cu. yds. Drop Bottom Body on legs are used.



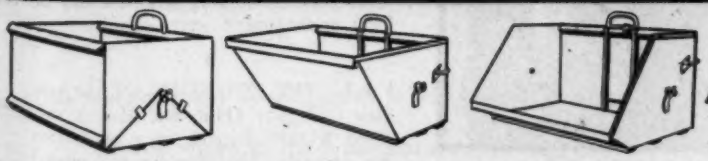
PRESS AND CUTTING DIVISION

Produces 24-1/2 cu. yds. of roofing scrap and cuttings per day. Five, 5 cu. yds. Drop Bottom Bodies on legs are used.



DIE CUTTING PLANT

Produces 30 cu. yds. of scrap per day. Four, 4 cu. yds. special duty Drop Bottom Bodies on legs are used.



DEMPSTER DUMPSTER TRADE MARK REG. SYSTEM

DEMPSTER BROS., INC., 778 Dempster Bldg., Knoxville 17, Tennessee

ical tests can be made with apparatus provided for the purpose. The facilities are available to manufacturers of groundwood, chemical pulps, semi-chemical pulps, paper, fiberboard, wallboard, hard board, and kindred products.

The sponsors of the laboratory are The Bauer Brothers Company, Springfield, Ohio; the Biggs Boiler Works Company, Akron, Ohio; Coe Manufacturing Company, Painesville, Ohio; Downingtown Manufacturing Company, Downingtown, Pennsylvania; Oliver United Filters, Inc., New York; and United States Wallboard Machinery Company, New York.

▼

DOWNINGTOWN BANQUET HONORS "OLD-TIMERS"

Four employees of the Downingtown Manufacturing Company, Downingtown, Pennsylvania, each with more than forty years of service, were recently honored at a banquet attended by approximately sixty supervisors and foremen.

These "old-timers" are: Walter Snyder, who came with the company in 1907 and is now chief draftsman; Andrew Walker, who started in 1902 and is now vice president in charge of manufacturing; William Mercer, who began in 1904 and is now chief inspector, and Thomas Philips, who started in 1905 and is now paymaster.

A General Electric Combination Radio and Alarm Clock was presented to each of the four men, and after dinner, Ellis Y. Brown, Jr., chairman of the board at Downingtown and former president of the company, gave an address of welcome and then reminisced about the "good old days" around the shop. Other "old-timers" present were: William Walker (1881) and John Hall (1890), both retired. Enright A. Ellis, company president, was absent on a business trip.

W. H. Richardson, San Francisco divisional manager of Timken (left), Oscar Johnson, Mine and Smelter Supply Company, Denver (center), L. J. Holderman, Timken manager from Los Angeles, get acquainted with their new Pikes Peak neighbors

▶▶▶ CHICAGO REPRESENTATIVE for worm gear speed reducers for the De Laval Steam Turbine Company, Trenton, New Jersey, is now L. D. Litsey whose headquarters are at the Litsey Equipment Company, Chicago. His experience in the application of industrial equipment was acquired with the Standard Seamless Tubes Company, the Wykoff Drawn Steel Company, the Bartlett Hayward Company, and John Waldron Corporation.

▼

CLARK ISSUES SIX FILMS ON MATERIALS HANDLING

New economical applications of modern materials handling machines are clearly shown by a series of six films prepared by the Industrial Truck Division of the Clark Equipment Company, Buchanan, Michigan.

In the 16 mm. films, both electric battery-powered and gas-powered fork lift trucks and towing tractors are shown at work, in operations that include many phases of modern packaging, loading and handling. The Clark films are available on a loan basis upon request to the Industrial Truck Division, Clark Equipment Company, Battle Creek, Michigan.

ROCK BIT PLANT OPENED IN COLO. BY TIMKEN CO.

A recent celebration marked the opening of Timken Roller Bearing Company's new Rock Bit Division plant in Colorado Springs at the foot of Pikes Peak. The "get-acquainted" reception and dinner at the famous Broadmoor hotel was given for over 200 members of the Chamber of Commerce, and industrialists from the Rocky Mountain empire. More than 2,000 citizens of Colorado Springs were shown through the factory and served refreshments during the open house.

The new plant will employ over 90 people, all from the immediate locality. Normal opening output of the plant is 10,000 rock bits a day. They are up to this production now, working a full time day shift and a partial night shift.

The Pikes Peak plant was set up by the Timken people to serve customers west of the Mississippi, and in Old Mexico and Canada. A plant in Mount Vernon, New York, produces rock bits for the eastern states.

▼

▶▶▶ A WATER CONSERVATION system which cost $200,000 has started operating at The Timken Roller Bearing Company, Canton, Ohio, to insure its plants the 7,200,000 gallons of water they need daily for operation. The system, consisting of a new two acre, 10,000,000 gallon reservoir and a 25 feet high, 60 feet long, and 30 feet wide cooling tower made of redwood on a concrete foundation, also saves more than 6,000,000 gallons a day of local underground water supply.

▼

▶▶▶ THE FOUNDRY OF the Sinclair Company (Holyoke, Mass.) suffered $3,000 damage in a two-alarm fire recently. The foundry was closed for several days during reconstruction work.

Downingtown Old-Timers: Left to right—Walter Snyder, chief draftsman; Andrew Walker, vice president in charge of manufacturing; William Mercer, chief inspector, and Thomas Philips, paymaster. Their combined years of service is 174, two years more than the age of our nation

TENAX FELTS ARE ECONOMICAL

SERVING THE PAPER INDUSTRY SINCE 1891

Our research and development is paying off for our customers in longer service and lower costs. If you would share in these advantages we suggest you afford us the opportunity of serving you.

LOCKPORT FELT COMPANY • NEWFANE, NEW YORK

MANAGERS OF NEW REGIONS NAMED BY ALLIS-CHALMERS

Two new regions for the general machinery division have been organized by Allis-Chalmers Mfg. Company, Milwaukee, Wisconsin.

P. F. Bauer has been named manager of the new central region with headquarters in Cleveland which covers territories of Cleveland, Toledo, Pittsburgh, Youngstown, Wheeling, Cincinnati, Detroit, Grand Rapids and Jackson. A member of the company since 1928, Mr. Bauer has recently been manager of the industrial sales department with headquarters in Milwaukee.

William Arthur, formerly Philadelphia district office manager, is manager of the new mid-Atlantic region with headquarters in Philadelphia which includes Philadelphia, Wilkes-Barre, Baltimore, York, Richmond and Charleston offices. The York and Charleston offices, formerly branch offices, become district offices under the regional plan.

▼

FOXBORO CO. ANNOUNCES SCHEDULE FOR 13TH YEAR OF INSTRUMENT COURSES

The Foxboro Company (Foxboro, Mass.), which has conducted training courses in the theory, application, operation and maintenance of industrial instruments since early in 1935, has announced its schedule for the remainder of 1948. There will be five courses, each of two weeks' duration, in the months of July, August, October, November and December.

Courses will also be arranged for companies wishing to send a group sufficiently large to warrant a special class for the study of particular instruments and applications. Special courses will also be arranged for specific industry groups. Similar facilities are offered by The Foxboro Company Limited, in Montreal, for the benefit of Canadian industry.

Over 900 representatives from more than 300 companies, in the United States, Canada and other countries, have attended these courses. Enrollment is by application to the Director of Training Courses at the home office.

▼

GOODRICH CAMPAIGN TO "WIPE OUT WASTE" CLOSES

A total of 13,489 suggestions from employees were received during the two-month "Wipe Out Waste" campaign recently concluded by The B. F. Goodrich Company, Akron, Ohio, among all units of its nation-wide organization.

Three prizes of $500 United States savings bonds, with federal withholding and social security taxes also paid, will be awarded to individuals whose suggestions during the campaign period have been judged most valuable. One will go to a nonsupervisory employee in manufacturing plants and offices, another to an individual in the management groups of the production units and the third to a member of the national field sales and operating organization. A large number of merchandise awards also will be made.

▼

▶▶▶ EASTERN DISTRICT headquarters and service offices of Harris-Seybold Company, Cleveland, have been moved from 75 Varick Street to 380 Second Avenue, New York City, J. W. Valiant, vice president and eastern district manager has announced.

FIRM OF GORDON, KINNEY AND STANINGER FORMED

Carl E. Staninger, a pioneer in the materials handling industry, has joined Alex Gordon and James P. Kinney, Michigan and northwest Ohio representatives for the Automatic Transportation Company, Chicago, as a partner and vice president. The new firm is called Gordon, Kinney, and Staninger, Inc., with Mr. Gordon retaining the position of president.

Until recently, Mr. Staninger was district manager of the Clark Equipment Company, a firm he is leaving after twenty-eight years. The three partners' experience in the industry totals close to three-quarters of a century, Mr. Gordon having served 33 years, Mr. Staninger 28, and Mr. Kinney 12.

Because of recent growth and planned expansion, construction of a new sales headquarters is to begin in the near future.

▼

▶▶▶ THE NEW LOCATION of the G. D. Jenssen Company main office is in the Electric Building, Public Square, Watertown, New York, a recent announcement states. The office was formerly on Eastern Boulevard, Watertown.

▼

▶▶▶ REMOVAL OF the general offices of the Philadelphia Quartz Company from 121 South Third Street, where they have been located for almost a half century, has been announced. On August 2 the company will occupy the eleventh floor of the Public Ledger Building, Independence Square, Philadelphia.

▼

J. O. ROSS INAUGURATES TWENTY-FIVE YEAR CLUB

The J. O. Ross Engineering Corporation, New York, has inaugurated a Twenty-Five Year Club composed of men who have been with the company for twenty-five years or more since it was founded in 1921. The five members of this new club at the present time are J. O. Ross, chairman of the board; S. W. Fletcher, president; Vice Presidents F. W. Partsch and A. E. Montgomery; and Richard Schultz.

With their wives, these five members were feted at a dinner given at Manoir Richelieu, Murray Bay, Quebec, on June 5, which was attended by more than 200 Ross officials and employees. Each of the twenty-five year men were presented with wrist watches inscribed to commemorate the occasion and the Club was presented with a plaque which will be inscribed with names of all new members as they become eligible.

ORDERS . . . SHIPMENTS . . . INSTALLATIONS

Reports Received from Allied Firms Covering New Orders and Installations of Their Products for Pulp and Paper Mills

Chicago Bridge & Iron Company, Chicago, Ill.—A 100,000-gallon elevated water tank, used to provide gravity water pressure for fire protection was built by this company for the new Port Wentworth (Ga.) mill of *Southern Paperboard Corporation*. The tank (illustrated) is 125 ft. to bottom.

E. D. Jones & Sons Co., Pittsfield, Mass.—Two Jones Majestic Jordan changeovers have just started up at the *National Container Corporation of Michigan*, Ontonagon, Michigan. The company's older units have been rebuilt on the basis of the performance of a new Jones Majestic purchased in 1945. All parts are new, with the exception of the Jordan shell and the base. . . . One of the largest jordans ever built, a Jones Leviathan, has just been put into operation at the plant of *Taggart Corporation*, Oswego, N.Y.

NEW ARMSTRONG Individual Dryer TEMPERATURE CONTROL

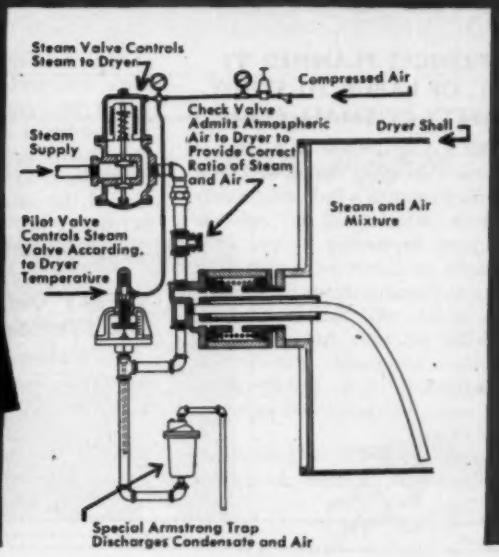
Keeps Wet End Dryers "Cool"

Prevents Sheet from Sticking and Curling

Controls Each Dryer Independently

Maintains Any Temperature from 100° to 250° F

Positive—Dependable—Guaranteed


Steam Valve Controls Steam to Dryer
Compressed Air
Check Valve Admits Atmospheric Air to Dryer to Provide Correct Ratio of Steam and Air
Dryer Shell
Steam Supply
Steam and Air Mixture
Pilot Valve Controls Steam Valve According to Dryer Temperature
Special Armstrong Trap Discharges Condensate and Air

Armstrong Individual Dryer Temperature Controls on the wet end of a paper machine make it possible to increase the sheet temperature as slowly as required for good drying. The temperature of the first dryer can be set at say 140° F, and that of the succeeding dryers at 160°, 180°, 200°, and 220° or whatever setting may be required for drying a particular sheet.

Thus, we have a positive, dependable answer to an old drying problem: maintenance of relatively cool wet-end dryers to prevent the sheet from sticking to the dryer surface, and to avoid curl or cockle due to over-drying on one side.

These controls are also used after the size press. Not only are the non-picking, non-curling advantages secured, but here fairly constant control of moisture content is also secured.

For complete information on this proved method of improving paper drying, write for BULLETIN 187.

Reduced Temperatures Secured by Controlled Mixture of Steam and Air

When steam and air are mixed at atmospheric pressure, the temperature of the mixture will be that corresponding to the partial pressure due to the steam. For example, if the partial pressure of the mixture due to steam is 3.7 lbs. absolute, the temperature will be 150° F. The Armstrong Control diagrammed above automatically controls the ratio of steam and air to maintain accurately the temperature for which it is set. If the temperature of the dryer tends to rise, the pilot valve bleeds compressed air to release pressure on the steam valve bellows, causing it to throttle. A decrease in temperature causes a reverse action. Atmospheric air for the mixture enters through the check valve when the condensing rate of the dryer causes pressure to drop below atmospheric. When temperatures above 212° F are desired, the check valve stays closed, no air enters and steam pressure is raised to the required point.

ARMSTRONG MACHINE WORKS

816 Hoffman Street, Three Rivers, Michigan

INVERTED BUCKET STEAM TRAPS • PAPER MILL SPECIALTIES

CONFERENCES PLANNED BY DEPT. OF LABOR TO STUDY SAFETY OF SMALL PLANTS

The U. S. Department of Labor has announced a meeting which has been termed the President's Industrial Safety Conference, which will be held in Washington, September 27-29. The Department of Labor is in charge of planning and arrangements for the conference, which will seek a practical nation-wide solution for preventing work injuries and deaths. Participation of management, labor, private safety groups, and other interested parties is being planned.

This conference will be preliminary to one that will be held during the spring of 1949, which will be a complete conference where a program of action to cure the conditions causing industrial accidents in the United States will be developed. Particular emphasis is to be placed on the problem of the small plant which has not heretofore had sound accident prevention programs.

▼

SAFETY CODE COMMITTEE STRESSES DUST CONTROL

Effective industrial dust and fume control by means of exhaust systems is being stressed in the work of the Sectional Committee on Safety Code for Exhaust Systems, Z9, representative of twenty-four national governmental, technical, and trade organizations, which is now working on the development of a safety code.

At a recent meeting of the committee, working under the procedure of the American Standards Association, it was agreed and strongly advocated that manufacturers of equipment, machinery, and apparatus which in operation produces dust or fumes should provide housings or enclosures as an integral part of the original design.

▼

▶▶▶ AN ALL-TIME PEAK in safety performance was reached in 1947 by Scott Paper Company (Chester, Pa.) with the lowest over-all number of lost-time injuries in all plants since the Scott Inter-Plant Safety Contest started five years ago. While the safety record was outstanding in the preceding year, it was further improved last year by a reduction of 53.2 per cent in lost-time injuries.

▼

NEW CONTEST HAS BEGUN

The twenty-fifth consecutive safety contest for the Pulp and Paper Section began on July 1, 1948, and will close on June 30, 1949.

As this issue closes, 304 mill participants have entered the contest; some entries may yet be received. These contests have been instrumental in establishing safe practices as an important, even vital, part of paper mill organizations.

Final scores in the last contest will be checked as received, and awards will be presented to the winners at the Annual Safety Congress in Chicago, October 18-22, 1948.

▼

NSC REPORTS IMPROVED SAFETY RECORD FOR 1947

Industry closed its books on 1947 with a better safety record than the year before, according to the National Safety Council. The 1947 industrial injury rates, released in advance of the 1948 edition of "Accident Facts," the Council's annual statistical yearbook, show that the over-all picture is improving.

The accident frequency rate for all industries submitting company reports to the Council, based on the number of disabling injuries per 1,000,000 man-hours, was 13.26 in 1947, a reduction of 10 per cent from the year before. The accident frequency rate for the pulp and paper industry was 18.32 in 1947.

The accident severity rate for all industries reporting to the Council, based on the number of days lost per 1,000

Roofing Machinery Mfg. Co. . . . .

Specialists in the design and manufacture of:

- Complete machines for fabrication of saturated felts, tar saturated felts, composition asphalt shingles and roll roofings including roll brick siding and tar saturators.
- Complete machines for laminating paper with asphalt or other adhesives.
- Complete machines for fabrication of insulated brick siding board.
- 2" and 3" steam jacketed pumps for handling concentrated black liquor, asphalt and other similarly highly viscous materials.

For information write to:

ROOFING MACHINERY MFG. CO.

Factory and Office: 1130 W. Cornelia Ave.

Phone: Lakeview 3231 Chicago 13, Illinois

man-hours, was 1.23 in 1947, a reduction of 7 per cent from the year before. The severity rate for the pulp and paper industry was 1.39 in 1947.

▼

SAFETY SCORES

▶▶▶ FOR THE FIRST TIME since November, all of the groups in the Paper Industry Safety Contest which started June 30, 1947, are showing a decrease in rates from last year. For all contestants there is a 16 per cent decrease from the previous contest for the 10-month period. Thirteen companies remain on the perfect record list.

Division I—Pulp and Paper Mills

Group A

(None.)

Group B

(None.)

Group C

The Mead Corp. (Sylva Div.), Sylva, N.C.

Armstrong Cork Co., Pensacola, Fla.

Group D

Hollingsworth & Whitney Co. (Abenaquis Mill), Madison, Me.

Container Corp. of America, Carthage, Ind.

Certain-teed Products Corp., Dallas, Tex.

Riegel Paper Corp. (Hughesville Plant), Riegelsville, N.J.

Kimberly-Clark Corp., Kapuskasing, Ont., Can.

Division II—Paper & Board Manufacturing

Group A

(None.)

Group B

Canadian Cellucotton Products Co., Ltd., Niagara Falls, Ont., Can.

Old Colony Envelope Co., Westfield, Mass.

Group C

Ft. Wayne Corrugated Paper Co. (Rochester Div.), Rochester, N.Y.

Thilmany Pulp & Paper Co. (Bag Mill), Kaukauna, Wis.

The Flintkote Co. (Hollywood Paper Box Div.), Los Angeles, Calif.

Bay West Paper Co., Green Bay, Wis.

▼

PRINTING AND PUBLISHING NOW A REGULAR SECTION OF NATIONAL SAFETY COUNCIL

At a recent meeting of the National Safety Council's board of directors, full sectional status was accorded to the Printing and Publishing Committee. This committee was formed last October. Chairman of the new Section is Walter Smith, safety director of R. R. Donnelley & Sons Company.

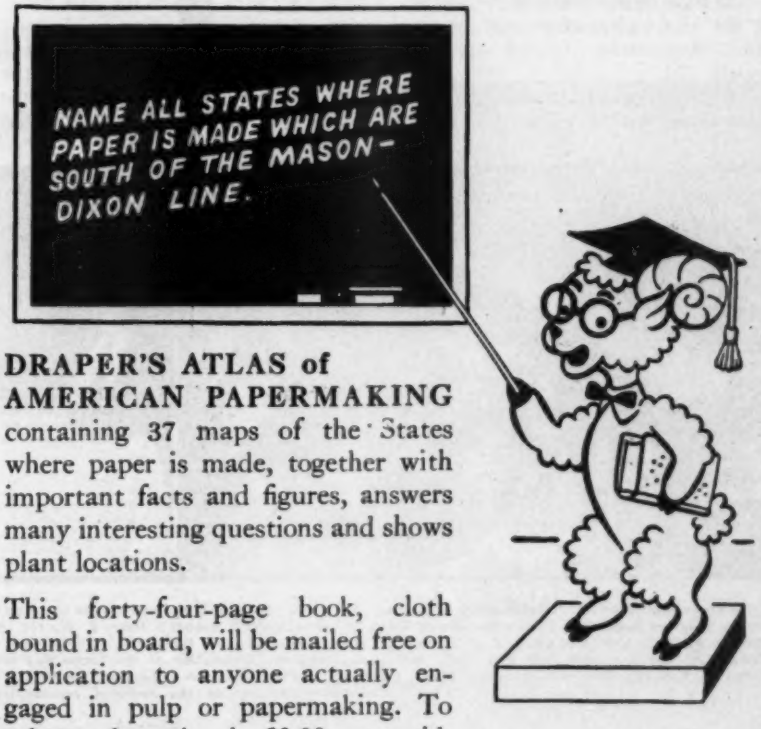
The printers and publishers who will comprise this new section have belonged to the Pulp and Paper Section of the Council. While that section will lose these members, it feels the work of the Council and its sections in furthering the cause of accident prevention is being rewarded, and the new section starts its work with the best wishes of those with whom it has been affiliated.

Other new sections officially established are the Electrical Equipment and the Glass and Ceramics.

▼

▶▶▶ A FIRST GLIMPSE of the new 1949 Safety Calendar put out by the National Safety Council reveals some very interesting new features. "Safety Makes Every Day a Better Day" is the theme carried throughout the twelve months. Purchasers may have a choice of three imprint styles—including two safety slogans—and a choice of ink colors. There is a contest featuring safety limericks, with complete rules on the back page. First orders are being accepted, without deposit, as the Council is anxious to have some idea of press run necessary. Send orders to D. A. Pickerell, director, Service Extension, National Safety Council, 20 North Wacker Drive, Chicago 6, Illinois.

What do you know about Paper?



DRAPER'S ATLAS of AMERICAN PAPERMAKING containing 37 maps of the States where paper is made, together with important facts and figures, answers many interesting questions and shows plant locations.

This forty-four-page book, cloth bound in board, will be mailed free on application to anyone actually engaged in pulp or papermaking. To others, the price is $2.00 postpaid, while the edition lasts.

The DRAPER Felt

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

CANTON, MASSACHUSETTS

Ralph E. Briggs, Sales Manager

BRADFORD WEST, Pittsfield, Mass. — WILLIAM N. CONNOR, Jr., Canton, Mass. — L. H. BREYFOGLE, Kalamazoo, Mich.

WALTER A. SALMONSON, 519-20 White Bldg., Seattle, Wash. — L. L. GRIFFITHS, Jr., Kalamazoo, Mich.

Answer to Question No. 7 N.C., Tenn., S.C., Ala., Fla., La., Ark., Texas, Ariz.

ASSOCIATIONS

N.W. Division of Superintendents Ass'n Holds Spring Meeting in Green Bay

▶▶▶ THE SPRING MEETING of the Northwestern Division of The American Pulp and Paper Mill Superintendents Association was held in Green Bay, Wisconsin, June 18 and 19, at the Hotels Beaumont and Northland. Registration totaled approximately 200.

Highlighting the meeting was a symposium on the subject of Pitch, which took up the entire morning of the second day. The interest in this subject was evidenced by the heavy attendance which overflowed the meeting room, with some of the men standing during the discussion.

Representatives of several pulp and paper mills in the area covered by the NW Division presented briefs of the problem as it exists in their individual mills. Experiences varied—some of them actually contradict older established concepts. The comments of the several panel members indicated the acuteness of the problem and the difficulties involved in developing a satisfactory treatment for eliminating it. It seemed the mills had left nothing undone in their efforts to correct pitch difficulties. One of the amusing yet serious conditions brought to light was the fact that pitch difficulties did not reappear consistently when the use of a pitch control agent was discontinued. Instead, production went on for some time without any further pitch difficulty. Just why such a condition obtained was not known. Lack of time prevented a full discussion of all questions put to the panel members.

Mace Harris, of Northwest Paper Company, Cloquet, Minnesota, functioned as moderator of the entire session. Other members of the Association who were active in the development of the program were L. S. Sabatke, of Marathon Paper Corporation, who functioned as program chairman, and

Joint dinner-dance at the Hotel Northland in Green Bay (Wis.) concluded the meeting of the Northwestern Division of the Superintendents Association. At the speakers table (left illustration) were: Right to left—Laurin S. Sabatke, Harry E. Weston, Mace V. Harris, Sigfred E. Ekman, Frank X. Kreiling, Richard M. Radsch, Harold Chew, C. O. Collipp, A. B. Hansen, and C. L. Durkee . . . Shown here (right illustration) are officers of the Northwestern Division of The American Pulp and Paper Mill Superintendents Association at the Green Bay meeting: Right to left—Sigfred E. Ekman, chairman; Frank X. Kreiling, first vice chairman; Mace V. Harris, secretary-treasurer; Laurin S. Sabatke, second vice chairman; Harry E. Weston, associate secretary-treasurer of the national organization

The Pitch Symposium (left) drew a heavy attendance. Participating in the symposium were Walter A. Sherman (center), Flambeau Paper Company, Park Falls, Wis., and Nathaniel L. Malcove (right), Northern Paper Mills, Green Bay, Wis.

Look at this bearing construction in E-M Heavy duty 2-POLE SQUIRREL CAGE Induction Motors

YOU CAN'T TAKE dependability for granted when you buy big motors. Make sure the toughness and reliability you want are built-in! The right kind of bearing engineering, for example, can mean the difference between faithful, profitable performance and costly unnecessary shutdowns.

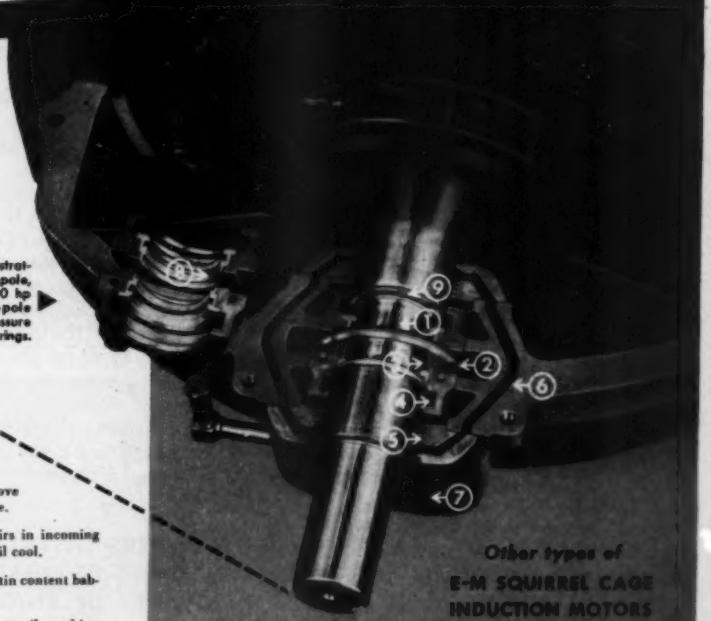
Consider 2-pole induction motors; whether you use these motors for boiler feed pumps, oil pipe line pumps or other exacting high-speed drives, you'll place bearing dependability first . . . in such applications, you can really appreciate the wear resistance, the protection and the cool-running qualities engineered into this E-M bearing.

Check and compare these other big-motor features, too: Long-life insulation, indestructible rotor construction, and motor protection. Close scrutiny will show that, in these features, as in bearing design, E-M Heavy-Duty Induction Motors are in a class by themselves. Products of a half century of big motor engineering, these motors may be described in four simple words: *More for your money.*

ELECTRIC MACHINERY MFG. CO.
MINNEAPOLIS 13 • MINNESOTA

Two-pole, drip-proof; ring lubricated bearings.

Bearing construction illustrated is available on 2-pole, 50-60 cycle, 200-700 hp motors. Larger 2-pole ratings use pressure lubricated bearings.



KOLENE-PROCESS

. . . electrolytic cleaning and centrifugal-cast bearing lining assures dense, uniform babbitt and tight bonding to the bearing sleeve.

1 Modern one-to-one ratio provides full seating.

2 Central location of oil ring confines turbulence.

3 Special contour of bearing insures uniform film distribution.

4 Drain channels prevent leakage.

5 V-groove seals with no wearing parts maintain full efficiency.

6 Anti-suction groove equalizes pressure.

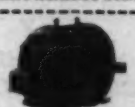
7 Large oil reservoirs in incoming air stream keep oil cool.

8 Bearing has high tin content babbitt lining.

9 Oil slingers prevent oil reaching shaft proper.

Other types of E-M SQUIRREL CAGE INDUCTION MOTORS

Two-pole, drip-proof, pressure-lubricated bearings.



Four or more poles; drip-proof; sleeve bearings.

Four or more poles; splash-proof, ball bearings.

THE FEATURES YOU WANT!

●Featuring many up-to-the-minute advances in big motor construction, E-M Squirrel Cage Heavy Duty Induction motors are available with drip-proof and splash-proof protection. E-M motors have NEMA Class B starting characteristics. Thus, they have low starting current, making practical in most cases the use of across-the-line starting with its simplicity and low cost. Write for further information . . . or have your E-M field engineer give you complete details.

E-M SPECIALISTS IN **BIG MOTOR** ENGINEERING

1300-TPA-2070

F. X. Kreiling, of Thilmany Pulp & Paper Company, who was general chairman.

The afternoon of the second day was given over to the presentation of three papers. "Correcting Some Flat Screen Problems—One Mill's Method," was presented by Donald L. Calkins, of Wausau Paper Mills Company. Two papers jointly treated the subject "Some Recent Developments in Kraft Mill Recovery." The first of these was presented by T. T. Collins, Jr., the

T. T. Collins, Jr., Thilmany Pulp & Paper Company, Kaukauna, Wis., delivered paper at the Green Bay meeting

second by P. H. West, both of Thilmany Pulp & Paper Company. The subject material made available through the presentation of these three papers was most helpful and practical.

Entertainment features of the convention included a golf tournament at the Oneida Country Club, bowling at Don Hutson's, a trapshoot at the Green Bay Yacht Club, and the regular luncheon and dinner meetings.

At the luncheon on Saturday, the 19th, J. MacNamara, of Rhinelander Paper Company, spoke on some of the labor relations problems of the day.

The meeting was concluded with a joint dinner dance at Hotel Northland. All other features of the program were held at the Beaumont.

▼

FIFTH NAT'L CHEMICAL EXPOSITION TO INCLUDE INDUSTRIAL CONFERENCE

Plans for the Fifth National Chemical Exposition to be held October 12-16 at the Chicago Coliseum include the revival of the National Industrial Chemical Conference, which was not scheduled at the last show held in 1946 because of the important fall meeting of the American Chemical Society at that time. All Exposition visitors will be welcome to attend the Conference, according to Dr. L. E. Clifcorn, chairman of the Exposition committee.

One of the new features of the Exposition will be the installation of the Technical Bureau, manned by Dr. Ward V. Evans, professor of chemistry at Loyola University. Dr. Evans will offer helpful, over-the-counter information to small business men and manufacturers seeking knowledge of how chemistry can be applied to their plans.

▼

SOCIETY FOR TESTING MATERIALS ELECTS NEW COMMITTEE D-6 OFFICERS

At the annual meeting of the American Society for Testing Materials, held in Detroit, June 21-25, 1948, officers of Committee D-6 on Paper and Paper Products were elected as follows:

Chairman—William R. Willets, Titanium Pigment Corporation Service Laboratories

Vice Chairman—Max A. Krimmel, Hammermill Paper Company

Secretary—Henry A. Birdsall, Bell Telephone Laboratories, Inc.

Committee D-6, which was formed over ten years ago, deals with testing methods for paper and paper products, the significance of such methods, nomenclature and definition of terms. It is also conducting a study of the need for specifications with the ultimate end of preparing them where they would be desirable. At present, the committee comprises some eighty members, including producers and consumers of paper, paperboard, and paper products, as well as general interest members.

▼

NEW OFFICERS INSTALLED AT MEETING OF WESTERN SOCIETY OF ENGINEERS

Verne O. McClurg, partner in the Chicago architectural and engineering firm of Mundie, Jensen and McClurg, was installed as president of the Western Society of Engineers at its annual meeting June 7. He succeeds William V. Kahler, vice president of the Illinois Bell Telephone Company.

Other officers elected were: first vice president, Gustav Egloff, research director of the Universal Oil Products Company; second vice president, H. P. Sedwick, vice president of the Public Service Company of Northern Illinois; and treasurer, M. P. Vore, Jr., secretary and treasurer of the Republic Flow Meters Company. Newly-elected trustees are Wilfred Sykes, president of Inland Steel Company, and Fred T. Whiting, vice president of Westinghouse Electric Corporation.

Ralph Budd, president of the Burlington Lines, has been elected an honorary member of the Society for "outstanding contributions to the engineering profession." Tenney S. Ford and Albert L. Tholin will be presented the Octave Chanute Medal for their prize-winning paper, "Chicago's Sewer Construction."

▼

TWO TAPPI FALL MEETINGS SCHEDULED FOR AUGUST

The first two meetings in the TAPPI fall series will be held in August. The dates of these meetings, which are held consecutively, run from August 16 through August 20.

The Institute of Paper Chemistry in Appleton, Wisconsin, is the place of the first meeting which will be held August 16-17 and is to be sponsored by the Plastics Committee. E. C. Jahn, New York State College of Forestry, will be chairman. The program of the first day will be given over to a symposium on "Resins to Fiber Bond," with Prof. Herman Mark, Polytechnic Institute of Brooklyn, as chairman. Four papers presented in this symposium are divided between the morning and afternoon sessions.

The second day sessions will follow much the same programming as the first day. The subject for that day will be "Plastics in Paper Converting," and the panel discussion will be under the chairmanship of R. H. Mosher, The Marvellum Company. Six speakers are scheduled for these sessions.

The second meeting will take place August 18-20 in Madison, Wisconsin. Sessions will be held at the Forest Products Laboratory and the University of Wisconsin. This meeting will be sponsored by the Fundamental Research Committee, with Harry F. Lewis, Institute of Paper Chemistry, as chairman. The feature subject of this meeting will be "The Physical Properties of the Components of Wood."

▼

▶▶▶ A JOINT MEETING of the Cincinnati and Dayton sections of the American Chemical Society held at Miami University, Oxford, Ohio, included discussion of the topic, "Glass Comes of Age." The two sections also toured the Hamilton, Ohio, plant of The Champion Paper & Fibre Company.

▼

▶▶▶ A NEW GROUP recently formed is known as the Central Ohio Society of Training Directors. The aim of this Society is to improve by research the standards of professional

service in the field of employee training. It has been announced that the Society will affiliate with the American Society of Training Directors. Lincoln M. Lenzi, of The Mead Corporation, Chillicothe, Ohio, has been elected as vice president.

▼

▶▶▶ AT THE SECOND MEETING of the American Metallizing Contractors Association, seven new members were accepted into membership. This association is entirely concerned with the application of the metallizing process by commercial contract. It was organized in December, 1947, and its membership already includes a large number of firms in the metallizing contract field.

▼

▶▶▶ INCORPORATION under the laws of the State of Illinois has been granted to the Association of Manufacturers Agents of the Paper Industry, according to Robert A. Stough, president. The purpose of the nonprofit organization is to promote the independent manufacturers' agent in the paper industry.

▼

COMING EVENTS

Aug. 10-13—First Western Packaging Exposition and Conference on Packaging, Packing and Shipping at the Civic Auditorium, San Francisco, Calif.

Aug. 16-17—TAPPI, first national fall meeting sponsored by the Plastics Committee, to be held at Institute of Paper Chemistry, Appleton, Wis.

Aug. 18-20—TAPPI, second national fall meeting, sponsored by the Fundamental Research Committee, to be held at the Forest Products Laboratory and the University of Wisconsin, in Madison, Wis.

Sept. 8-10—Summer meeting of the Technical Section, Canadian Pulp and Paper Association, Harrison Hot Springs, B.C.

Sept. 13-17—Third Instrument Conference and Exhibit, Philadelphia Convention Hall, Philadelphia, Pa.

Sept. 27-29—TAPPI (National) fall meeting, Mechanical Pulping Committee, Poland Springs, Me. Poland Spring House (Joint meeting with the CPPA Technical Ass'n.).

Oct. 11-13—TAPPI (National) fall meeting, Testing Division, Pittsburgh, Pa., at the Mellon Institute (Headquarters at William Penn Hotel).

Oct. 12-16—Fifth National Chemical Exposition by the Chicago Section of the American Chemical Society, Chicago Coliseum, Chicago, Ill.

Oct. 18-22—Thirty-sixth Annual Safety Congress, Chicago, Ill.

Oct. 25-28—TAPPI (National) fall meeting, Third Engineering Conference, Buffalo, N.Y., Statler Hotel and the auditorium of Westinghouse Electric Co.

Oct. 28-30—Meeting of National Paper Trade Association, Hotel Stevens, Chicago, Ill.

MATERIAL HANDLING *News*

Positioning heavy steel tubing for lathe operator by gas-powered Trucloader

Five boxes of bananas are easily handled by Elec-Trucloader with special forks

Hustling boxes of tools and parts is one of many uses for this gas-powered Trucloader

Here's an ideal low-cost answer to a thousand-and-one high-cost jobs... *the*

CLARK TRUCLOADER

. . . either gas or electric battery-powered

It's the countless *little* handling jobs that are Industry's subtlest thieves because they are so easy "not to notice"—that multitude of loads from 200 to 1000 pounds, familiar to every busy plant and dock and warehouse. Subtle thieves because they look innocent—yet their petty thieveries total a staggering sum!

Put an end, finally, to their costly pocket-picking — by using the Clark Trucloaders.

Use these Trucloaders in the plant: for setting-up of machining jobs, handling jigs and fixtures, loading furnaces, fetching tools, hustling dies, castings and other "heavies" to storage or scrap. Use them in the warehouse: to tier palletized units, carry empty drums and crates, handle loads on low-capacity elevators.

Use the Trucloaders for loading and unloading carriers—highway or rail. Use them as tireless, ever willing handymen for the 1000-and-one lift-and-carry chores common to all busy establishments. You'll *find* many uses—because every use means a substantial saving.

A wise first step is to talk about your needs with a Clark field representative. He can tell you how businesses like yours make big savings with the Trucloaders—both gas-powered and electric battery-powered. It's always good business to CONSULT CLARK.

CLARK ELECTRIC AND GAS POWERED **FORK TRUCKS**
AND INDUSTRIAL **TOWING TRACTORS**

INDUSTRIAL TRUCK DIV., CLARK EQUIPMENT COMPANY BATTLE CREEK 22, MICH.
REPRESENTATIVES IN PRINCIPAL CITIES THROUGHOUT THE WORLD

NAMES in the News

PERSONALS

EDWIN SUTERMEISTER GIVEN HONORARY DEGREE OF DOCTOR OF SCIENCE

An honorary degree of Doctor of Science was conferred upon Edwin Sutermeister, of Westbrook, Maine, by the University of Maine at the commencement exercises held in Orono on June 20.

Dr. Sutermeister was graduated from the Massachusetts Institute of Technology in 1899, and since then he has been active in pulp and paper research and development. In 1935, he was chosen the TAPPI Medallist, receiving that honor "in recognition of his many contributions to the art and science of papermaking." He is well known as the author of *Chemistry of Pulp and Paper Making*, of *Casein and Its Industrial Applications*, and of a great many articles dealing with all the phases of pulp and paper technology.

Dr. Edwin Sutermeister

For many years, Dr. Sutermeister has been a member of the research staff of the S. D. Warren Company at Cumberland Mills, Maine.

HAMMERMILL PROMOTIONS

Major changes in the sales organization of the Hammermill Paper Company (Erie, Pa.) have resulted in promotions for John D. Zink, A. Ellis Frampton, and Grant Richardson.

Mr. Zink recently was elected a vice president of the company and named to the newly created title of director of merchandising. Before joining Hammermill twenty-seven months ago, he was president of Strathmore Paper Company. He has been president of the Writing Paper Manufacturers Association, vice president of the American Paper and Pulp Association, and treasurer of the National Council for Stream Improvement. During the war he was a member of the industry committee of both the War Production Board and the Office of Price Administration.

A. Ellis Frampton, assistant secretary, was appointed manager of advertising and sales development, while Grant Richardson was named assistant vice president and manager of sales.

Mr. Frampton has been a member of the Hammermill company for twenty-eight years and has been advertising manager since 1927 and assistant general sales manager since 1933. A Hammermill employee since 1914, Mr. Richardson had until his recent promotion been the company's eastern district sales manager and export manager.

The reorganization of Hammermill's sales structure was made to provide a complete merchandising effort for the increased production of Hammermill lines, and in preparation for the retirement next December of Harrison R. Baldwin, vice president in charge of sales.

John D. Zink

A. Ellis Frampton

Grant Richardson

gy.
as
of
er-

n-
n-
Ir.
o-
is-
n-

's
a
ne
ill
e-
R.
of

Why

No single type of dryer felt will meet the needs of all mills. But HOOPERWOOD "Canvas Engineering" has the answer to that problem—a specific HOOPERWOOD Dryer Felt for each requirement.

If it is a rugged, heavy felt you need for fine finish in normal production . . . or a lightweight, extra-porous felt for faster drying . . . or an Asbestos Felt to withstand advanced temperatures in high speed production of Kraft and other heavy papers—there is a HOOPERWOOD felt to fit your need.

Mill Superintendents find this service invaluable in suiting the particular requirements of their mill—even down to each machine position if desired.

Make your next felt *right*—specify HOOPERWOOD.

WM. E. HOOPER & SONS CO.

New York **PHILADELPHIA** Chicago

Mills: **WOODBERRY, BALTIMORE, MD.**

Engineered

DRYER FELTS

Photo courtesy of the Pusey and Jones Corp.

HOOPERWOOD DRYER FELTS

COTTON AND ASBESTOS

R. S. HATCH RETIRES FROM WEYERHAEUSER—SUCCESSOR IS DR. H. W. BIALKOWSKY

R. S. Hatch, director of research for the Weyerhaeuser Timber Company's pulp division for the past fifteen years, will retire August 1. New director of research will be Dr. H. W. Bialkowsky.

After graduating from Syracuse University with the degree of Bachelor of Science, Mr. Hatch spent one year at Massachusetts Institute of Technology, and was private assistant in the department of organic chemistry. He then spent three years with the Ozone Vanillin Company, following which he was with Heller and Merz for three years. After that, he was with Crocker McElwain Company, paper manufacturer in Holyoke, Massachusetts, for seven years, first as chemical superintendent and later as general superintendent. Later, he spent five years with Hammerslie Manufacturing Company; from there to Neenah Paper Company. Mr. Hatch assisted in designing the first mill of Fraser Limited, at Madawaska, Maine, after which he was made manager of the Peerless Paper Division of The Mead Pulp and Paper Company, Dayton, Ohio. He then spent two years as manager of the East Hartford Manufacturing Company, followed by six years with the Pulp Bleaching Corporation. From there he went to Weyerhaeuser in 1933 as director of research.

Mr. Hatch is a charter member of TAPPI, and served as president of that organization in 1919 and 1920.

Dr. Bialkowsky was graduated from Massachusetts Institute of Technology in 1928 and spent the following two years with the American Writing Paper Company. In 1930, he entered the newly-formed Institute of Paper Chemistry and in 1933 he was awarded his doctor's degree in the first graduating class of the Institute. For a time he was chief chemist at the Gilbert Paper Company and later came to the Weyerhaeuser Everett mill as technical director. He became associate director of research two years ago.

The pulp research laboratory in Longview does the research for all three pulp division mills at Everett, Longview, and Springfield, Oregon. During the present construction program, the laboratory facilities have been modernized and enlarged to facilitate research into the many problems involved in complete forest utilization as they relate to the pulping processes.

▼

GEO. FARRAH TO STAFF OF CONTAINER LABORATORIES

New member of the staff of Containers, Inc., Chicago, is George A. Farrah, formerly technical superintendent at the Manayunk (Pa.) plant of Container Corporation of America.

Mr. Farrah has had broad experience in the technical and production phases of paperboard manufacturing, corrugated and solid fiber production development, and quality maintenance. He is a graduate of the New York State College of Forestry, where he majored in pulp and paper manufacture.

▼

G. L. BIDWELL SUCCEEDS FATHER AS DIRECTOR OF RIEGEL PAPER COMPANY

G. Lamont Bidwell has been elected to the board of directors of Riegel Paper Corporation (Milford, N. J.) He succeeds his father, George L. Bidwell, who resigned after serving on the board for thirty-four years.

G. Lamont Bidwell

George L. Bidwell started with Riegel Paper Corporation in 1896. He was named general superintendent in 1907 and elected to the board of directors in 1914. He was elected vice president and general superintendent in 1929 and retired in 1944.

G. Lamont Bidwell is manager of Riegel's Milford plant. He joined the company in 1930 and became superintendent of the mill department at Milford in 1942. He was named manager at Milford in February of this year.

▼

INFILCO, INC., MAKES A. A. KALINSKE ITS NEW DEVELOPMENT DIRECTOR

The promotion of A. A. Kalinske to the position of director of development has been announced by Infilco, Inc., Chicago. Mr. Kalinske formerly was chief hydraulic engineer. In his new position, he will direct all develpment activities for the company including its hydraulic, mechanical and electrical research laboratories.

Author of more than 50 technical papers on fluid mechanics and allied subjects, Mr. Kalinske was recently awarded the Karl Emil Hilgard prize in hydraulics by the Hydraulics Division of the American Society of Civil Engineers.

▼

ALEXANDER CALDER, JR. ELECTED A DIRECTOR OF UNION BAG & PAPER

Announcement has recently been made of the election of Alexander Calder, Jr., as a director of the Union Bag & Paper Corporation. At present he is the assistant to Leonard J. Doyle, vice president in charge of sales.

Mr. Calder joined the Union Bag organization in 1940. He has served

R. S. Hatch

Harold W. Bialkowsky

Alexander Calder, Jr.

in the sales department and as assistant to the director of industrial relations. During the war he was an intelligence officer with the Board of Economic Warfare, and subsequently served for two years as a naval officer in the Pacific.

Mr. Calder graduated from Dartmouth College in 1938 and the Harvard School of Business Administration in 1940.

▼

F. H. WEISMULLER NAMED GEN'L MGR. AT DU PONT

Frederick H. Weismuller has been appointed general manager of the Pigments Department of the Du Pont Company, succeeding John F. Daley, who will become general manager of the Organic Chemicals Department on that date.

Mr. Weismuller has been engaged in pigments production since 1926, when he joined the Krebs Pigment and Chemical Company as a shift foreman at its Newark, New Jersey, plant. Continuing there after the company became associated with Du Pont, he became plant manager in 1932. In 1935 he became assistant production manager of the Pigments Department in the Wilmington, Delaware, office and advanced to assistant general manager in 1946.

▼

WM. GREELEY ELECTED AS TREASURER OF F. C. HUYCK

William Greeley was elected treasurer of F. C. Huyck, Albany, New York, at a recent meeting of the board of directors. Harry Eldridge, who has been both first vice president and treasurer of the company, is thus freed to devote full time to his vice presidential duties and to the broader phases of finance, according to Francis H. Eldridge, president.

After graduating from Union College in 1920, Mr. Greeley began his career with F. C. Huyck & Sons as assistant to the head of the Cost Department. After a short time he became a sales representative for the company in the papermakers' felt field, covering the New England and middle Atlantic states. Since 1930, he has been sales manager of the Felt Division.

▼

FRASER COMPANIES, LTD. ELECT C. M. MATHESON AND JOHN NEILL AS DIRECTORS

Fraser Companies, Ltd. (Edmundston, N.B.), has announced the election of C. M. Matheson to the boards of directors of the subsidiary companies of Fraser Paper, Ltd., and the Restigouche Company, Ltd. John Neill has been elected to the board of directors of Fraser Companies, Ltd.

Mr. Matheson is at present general sales manager of the Restigouche company and manager of the pulp and paperboard sales of Fraser Companies, Ltd., as well as the company's representative in Montreal. He has been with the Fraser organization since 1919. Mr. Neill is president of James S. Neill and Sons, Ltd., wholesale and retail hardware and sporting goods company in Fredericton, New Brunswick.

▼

DAVID COLESBERRY NOW GEN. SALES MANAGER FOR HARRINGTON & KING CO.

The appointment of David K. Colesberry as general sales manager of The Harrington & King Perforating Company, Chicago, has been announced.

Mr. Colesberry comes to Harrington & King after 22 years with The Sharples Corporation, centrifugal and process engineers of Philadelphia. He is well known in the industrial field throughout the country.

▼

VENI OLESKEVICH NAMED ASS'T MGR. BY ABITIBI

Chief chemist at the Smooth Rock Falls, Ontario, mill of the Abitibi Power and Paper Company since 1935, Veni Oleskevich, has been made assistant manager there.

Mr. Oleskevich was born in Odessa, Russia, in 1908 and came to Canada with his parents at the age of four. He started working at the Smooth Rock Falls mill during vacations while attending McGill University in Montreal. After receiving a degree in chemical engineering in 1932, he returned to Abitibi to take the post of laboratory assistant.

▼

JAMES THORNTON ADDED TO SALES ENGINEERING STAFF OF DOWNINGTOWN

James S. Thornton recently was added to the sales engineering staff of The Downingtown Mfg. Company (Downingtown, Pa.). He formerly was employed in the same capacity by the Lamson Corporation, manufacturers of mechanical conveyors. Prior to this, Mr. Thornton was in the Army for four years, serving at the time of his discharge as lieutenant colonel.

A graduate of the Massachusetts Institute of Technology in 1941 with a B.S. degree in mechanical engineering, Mr. Thornton comes to Downingtown with a family background in the paper industry.

David K. Colesberry

James S. Thornton

Life Line FOR ANY MILL

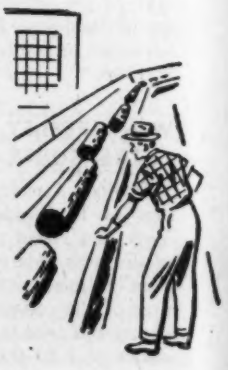
. . . Rex PULPMILL

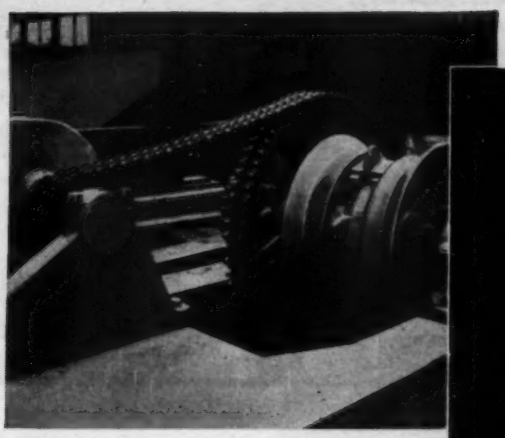
THE wood handling system is truly the "life line" of a mill. That's why so many mills have standardized on the Rex Line of Standard Pulpmill Chains. No worries about premature chain failures to break the life line . . . hold up production . . . step up costs, with these husky chains on the job. They're designed and built to add life to any wood handling system . . . to keep going under loads and service conditions where ordinary chain would quickly fail.

Whether they're steel or malleable, all Rex Chains are precision-built of the finest materials . . . assembled by the most modern manufactur-

Feeding the enormous appetite of the barking drum, this Rex Combination Chain Conveyor keeps a steady supply of pulp logs moving from saws to drum.

Rex Chains do a double job in this application. The upper conveyor . . . Rex Combination Chain . . . carries the logs into the mill and the lower conveyor . . . Rex Drop Forged . . . handles the bark from barking drum to boiler.

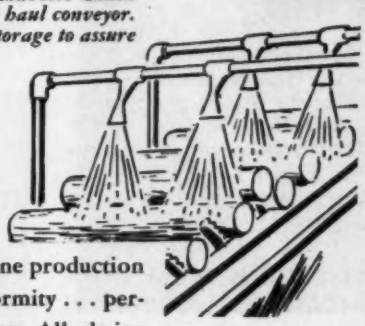




A double strand of Baldwin-Rex Roller Chain transmits the power for the log haul in this mill. The chain absorbs the shock loads, protecting the motor against unnecessary strains.

From splitter to barking drum, Rex Combination Chain, a big favorite in this pulp mill . . . furnishes the moving power.

Eight strands of Rex Steel Chabelco Chain make up this heavy-duty log haul conveyor. Conveyor also serves as log storage to assure a ready supply for the mill.



L CHAINS

ing methods. Modern assembly line production assures product quality and uniformity . . . permits closer inspection and testing. All chains are specifically designed for pulp mill service . . . to stand up under the particular job for which they are intended.

Right through your mill . . . from log haul to finished pulp, you'll find you can add life to the "life line" of the mill by standardizing on Standard Rex Pulpmill Chains. For complete information on how Rex Chains can help you, call your Rex Field Office or write to Chain Belt Company, 1714 W. Bruce St., Milwaukee 4, Wis.

Hogged fuel for the boilers is carried by Rex Drop Forged Chain equipped with wooden flights. Discharge is through the return run of the conveyor. Note the adjustable chutes.

Supported by easy-rolling Rex Belt Idlers, this belt conveyor . . . 60 inches wide . . . handles a big load of chips to the digesters.

CHAIN BELT REX COMPANY

DRIVE AND CONVEYOR CHAINS

CAMERON CO. ANNOUNCES FIVE PERSONNEL CHANGES

At the last directors meeting, J. Scheuermann was elected vice president of both the Cameron Machine Company (Brooklyn, N.Y.) and the Cameron Machine Company of Canada Limited. Mr. Scheuermann is also sales manager of the company.

At the same meeting, Ross Mekeel was elected secretary. Mr. Mekeel has served for many years as purchasing agent and will continue in that capacity. Tom Carter, formerly of the New Design Department, now becomes manager of the Engineering Department.

R. W. Cummings has resigned as secretary of the company, and after a three-month vacation, will return to act as sales representative in the Southern states. E. J. Ward takes over Mr. Cummings' previous duties as service manager.

▼

R. C. BURTON TO DIRECT SALES OF UNION BAG'S CORRUGATED CONTAINERS

Richard C. Burton, assistant director of corrugated container sales for Union Bag & Paper Corporation, has been appointed director, succeeding Walter T. Sheldon, who has resigned. Mr. Burton's headquarters will be in the Woolworth Building, New York.

In addition to directing Union Bag's container sales force in the field, Mr. Burton will also supervise sales from Union's branch plants, which are under the direction of Roy Williams at Trenton, New Jersey, and M. Norian and M. Madson in Chicago. R. J. Harley continues as district manager of the general container sales force.

Mr. Burton, who has had eleven years experience in the corrugated container and packaging field, served in the Navy during the war, writing specifications for overseas shipments and also taught packaging to Navy personnel.

Richard C. Burton

Left to right: J. Scheuermann, Ross Mekeel and Tom Carter

▼

▶▶▶ The Direct Mail Advertising Association, Inc., has announced the appointment of *Frank Frazier* as executive director with headquarters in New York at the Association's offices. Since 1945, Mr. Frazier has been executive director of promotion for E. P. Dutton & Company, Inc.

▼

ESGATE RESIGNS FROM THE AMERICAN PULPWOOD ASS'N

The resignation of E. E. Esgate from the staff of the American Pulpwood Association has been announced by the Association's board of directors. Mr. Esgate's services terminated on July 1. He had been functioning as logging engineer and was responsible for the direction of the mechanization program. It is stated that this activity will continue under the direction of a replacement on the staff, which will be announced later.

The Association announces that Mr. Esgate's services will be available to members of the industry as a consultant on equipment and operational problems. (*See announcement of E. Esgate Associates, which appears in the Allied Section of this issue.*)

▼

G. A. DUFF ASSUMES NEW PUBLIC RELATIONS POST AT SCOTT PAPER COMPANY

Appointment of G. A. Duff to the newly created post of manager of public relations has been announced by Scott Paper Company (Chester, Pa.).

Mr. Duff had been assistant advertising manager of the company since 1941. He has been with the Scott company's distribution group for twenty-one years, starting as a salesman and later serving as district manager in Buffalo, Boston, Pittsburgh, and Chicago. He was divisional sales manager at St. Louis prior to entering the advertising department.

Also announced by the company were the appointments of Theodore W. Prescott as assistant advertising manager in charge of retail advertising and promotion and Fred W. Witt as assistant advertising manager in charge of industrial advertising.

▼

ST. REGIS SUBSIDIARIES ANNOUNCE NEW OFFICERS

At a meeting of directors of St. Regis Sales Corporation, New York, a subsidiary of St. Regis Paper Company, the following new officers were elected in addition to those already serving: Arch Carswell, executive vice president; H. W. Sloan, vice president and director; John F. Gruber and Walter M. Neill, vice presidents.

Directors of Taggart Corporation, also a St. Regis Paper Company subsidiary, have elected W. R. Adams and Williard E. Hahn as vice presidents and John E. Cowles as comptroller of that company.

▼

FOREST PRODS. RESEARCH SOCIETY ELECTS VAN HAGAN TO OFFICE OF SEC'Y-TREAS.

The recent appointment of Charles E. Van Hagan, of Madison, Wisconsin, to the position of secretary-treasurer of the Forest Products Research Society, of Madison, was effected by action of the executive board. Mr. Van Hagan will succeed Thomas R. C. Wilson, who plans to complete his work with the Society in August and resume his practice as a consulting timber engineer.

For the past four years, Mr. Van Hagan has been technical writer and reviewer with the U. S. Forest Products Laboratory. A registered professional engineer, he is a member of the Amer-

ican Society of Civil Engineers. He received a civil engineering degree at the University of Wisconsin in 1936, and later did graduate work in transportation at Yale University.

▼

▶▶▶ *John T. Renshaw* has been appointed manager of the Philadelphia office of E. P. Lawson Company, Inc., New York, succeeding *Herman Sinnigen,* vice president of the company, who has retired. For the past two years, Mr. Renshaw has worked with Mr. Sinnigen in the Philadelphia territory. Before joining E. P. Lawson, Mr. Renshaw was with the Miller Printing Machinery Company.

▼

NORDBERG COMPANY NAMES R. R. SCHULTZ SALES MGR.

The promotion of R. R. Schultz to sales manager of the Crusher and Process Machinery Division of Nordberg Manufacturing Company, Milwaukee, Wisconsin, has been announced.

R. R. Schultz

Mr. Schultz joined Nordberg in 1938 as a sales engineer and was promoted to assistant sales manager in 1946. Prior to coming to Nordberg he was associated with the Traylor Engineering and Manufacturing Company, Allentown, Pennsylvania. He attended the University of Cincinnati and Colorado School of Mines, receiving a degree in metallurgical engineering from the latter school.

▼

▶▶▶ *Clyde H. Irwin* has been assigned as field engineer in charge of the Pittsburgh office of Infilco Inc., Chicago. From 1943 to 1946 he was research assistant and research associate at the Case School of Applied Science. For his work there on the problem of detecting and eliminating contamination in military water supplies, he was recently awarded a Certificate of Merit by the National Defense Research Committee.

▼

AMER. BRAKE SHOE NAMES R. H. SCHAEFER HEAD OF RESEARCH & DEVELOPMENT

Raymond H. Schaefer has been appointed director of research and development by the American Brake Shoe Company, New York City.

R. H. Schaefer

Mr. Schaefer first started with the Brake Shoe Company in 1940 as an assistant foundry metallurgist for the American Manganese Steel Division. He became chief metallurgist in charge of metallurgical research and the company's experimental foundry in 1945. He attended Carnegie Institute of Technology from which he received the degree of Bachelor of Science in 1934.

▼

▶▶▶ The general sales offices of the Diamond Match Company, New York, have appointed *James B. Dickinson* as sales manager of its wood, paper and pulp products. Another appointment is that of *William M. Howard* as sales manager of book match advertising.

▼

▶▶▶ Effective July 1, *H. V. Hart,* formerly operating from Deferiet, New York, as woodlands manager of St. Regis properties in Canada, New York, and New Hampshire, was appointed general manager of the pulpwood operations of the printing publication and converting paper division of St. Regis Paper Company, with headquarters at 230 Park Avenue, New York City.

CRYSTAL TISSUE PROMOTES M. T. McMURRAY, R. E. KING

M. Thomas McMurray has been appointed to the position of assistant sales manager of The Crystal Tissue Company, Middletown, Ohio. In his new capacity he will assist Stanley H. Reed, vice president and general sales manager. Mr. McMurray joined the Crystal sales staff several years ago after serving four years as a lieutenant in the Navy.

In addition to his duties as advertising manager of the company, Richard E. King also assumes the responsibilities as sales manager of converted produces. This is a new position created to meet the increasing demands for Crystal resale products in the gift wrapping and waxed paper field.

▼

GILBERT PAPER COMPANY APPOINTS G. W. GRIFFIN AS EASTERN SALES AGENT

The appointment of George W. Griffin as eastern sales representative for Gilbert Paper Company (Menasha, Wis.) has been announced. Mr. Griffin will divide his time between the Gilbert New York office and the territory with charge over service, contact and sales promotion.

George W. Griffin

For the past five years Mr. Griffin has been sales representative for Standard Register Company, Dayton, Ohio. He previously was employed by the American Writing Paper Corporation, Holyoke, Massachusetts.

▼

▶▶▶ Head of the Pulp and Paper Department of The New York State College of Forestry at Syracuse University, *Professor Clarence E. Libby,* is visiting a number of paper and pulp mills in

Virginia and North Carolina in connection with the hardwood pulping research project of the College. His study includes the requirements of these mills as well as their progress in the use of hardwood.

▼

PRESIDENT FLETCHER OF J. O. ROSS ENGR. CORP. HONORED AT LUNCHEON

An honorary surprise luncheon was given for S. W. Fletcher, president of J. O. Ross Engineering Corporation by the employees of the company's New York office on July 1, the same day on which Mr. Fletcher joined the organization in 1923.

S. W. Fletcher

A motion picture projector screen was presented to Mr. Fletcher by the employees as a token of their esteem. W. K. Metcalfe and H. G. Rappolt were in charge of arrangements; the presentation was made by Richard Schultz, and R. Sadwith served as toastmaster.

▼

▶▶▶ At the annual graduation ceremonies of Stevens Institute, an engineering college in Hoboken, New Jersey, *D. W. Figgis,* president of the American Can Company of New York, was presented an honorary doctor of engineering degree and a citation for distinguished service in the field of human relations in industry. Mr. Figgis was then introduced as keynote speaker at the graduation.

▼

▶▶▶ The post of assistant sales manager of Signode Steel Strapping Company, Chicago, will be filled by *Milton C. Carlson.* With a company service record dating back to 1929, he has successively held positions as representative with headquarters in Davenport, Iowa, district sales manager at St. Louis and Chicago district sales manager.

▼

ARTHUR KOEHLER RETIRES FROM FOREST PRODS. LAB.

Arthur Koehler, widely known scientist and authority on wood structure and identification at the U.S. Forest Products Laboratory in Madison, Wisconsin, retired June 30. A member of the staff since 1914, Mr. Koehler had been chief of the Laboratory's Division of Silvicultural Relations for twenty-five years.

Succeeding Mr. Koehler as division chief is Benson H. Paul, silviculturist on the Laboratory staff since 1922. A graduate of New York State College of Forestry, Mr. Paul is an authority on the relation of growth conditions to wood quality. He came to the Laboratory from the New York State Conservation Department and has written numerous publications on wood properties as affected by forest growth conditions.

▼

▶▶▶ At the quarterly meeting of the board of directors of John A. Manning Paper Company, Troy, New York, *James F. Adams* was renamed president. *Eugene Warren,* for more than 45 years an employee, announced his retirement as treasurer. He will be succeeded by *Joseph V. H. Hayes.*

▼

RAYMOND J. LEE MADE A BOARD MEMBER OF NAT'L BETTER BUSINESS BUREAU

The first executive connected with the paper industry to sit on the board of the National Better Business Bureau, New York City, is Raymond J. Lee, vice president of the Lockport Felt Company, Newfane, New York. Mr. Lee was elected to the Board on June 25.

Raymond J. Lee

It is felt that Mr. Lee will bring to the Board experience that is most valuable, since the publishing and direct mail businesses dependent upon solid advertising practices constitute the largest users of paper, and also since these two fields are dependent largely upon sound advertising practices.

▼

▶▶▶ The election of *Arthur W. Crossley* as treasurer of Diamond Alkali Company, Cleveland, has been announced. For the past three years, Mr. Crossley has been assistant general manager of the Potomac Electric Power Company, Washington, D.C. He succeeds William H. Evans, who, in addition to his duties as general manager of Diamond's six plants, has been acting treasurer since March of this year.

NEPCO PROMOTES DR. H. W. ROWE, FRANK H. COLDWELL

The advancement of Frank H. Coldwell as assistant manager of power and Dr. Herbert W. Rowe as assistant technical director has been announced by Nekoosa-Edwards Paper Company, Port Edwards, Wisconsin.

A member of the company since 1925, Mr. Coldwell was serving as Port Edwards superintendent of power prior to his new appointment. After graduating from Massachusetts Institute of Technology, he spent two years in the Nepco power office, becoming plant engineer at Port Edwards in 1927. He has been in charge of the load dispatchers in the Port Edwards engine room with direct control of the electric power from Centralia, Port Edwards, Nekoosa and Nepco Lake with the interconnecting lines to Consolidated, and all Nepco turbines. Steam and electric power, water supply and steam distribution have also been under his supervision.

Dr. Herbert W. Rowe (left) and Frank H. Coldwell

Dr. Rowe is a graduate of Wabash College and earned M.S. and Ph.D. degrees at the Institute of Paper Chemistry. He first became associated with the Nekoosa-Edwards company in 1939 as a member of the technical staff. In 1940 he was assigned to work on general quality and standards. Later he served as a chemical engineer at the St. Louis Ordnance plant for two years. From July, 1944, to 1946 he was chief chemist of Sefton Fibre Can Division of Container Corporation of America, returning to Nepco after completion of these duties. Since July 1, 1947, he has been research director of Nekoosa-Edwards.

▼

▶▶▶ The H. K. Ferguson Company, Cleveland, New York, and Houston, has announced the appointment of *Harry C. Williams* as general manager of the company. Mr. Williams has been associated with General Electric Company where he was a division manager for eight years. He also was formerly vice president and general manager of the Chemical and Dye Corporation and served on the War Production

Make a NORTHWEST the dependable heart of your pulp yard!

YOUR Cranes are the heart of your pulp yard—they are the heart of this part of the job and you can't afford to have anything but the best in a *Key Spot* like this.

They should be crawler cranes! Crawler cranes go anywhere. They load or unload from side or end and handle a whole train of cars without extra track or without switching equipment. Stacking can be done right up to the rail side just as with locomotive type equipment and without locomotive crane objections.

Your yard crane should be a *Northwest Crawler* because Northwest brings you a combination of advantages found in no other crawler crane. Greater simplicity of design means lower upkeep and makes maintenance easy. The "Feather-Touch" Clutch Control assures smoother, more effortless operation without the complications of pumps and piping. It means continuous high output without fear of control failure. Uniform Pressure Swing Clutches take the jerks and grabs out of swinging and reduce adjustment. Cast Steel Machinery Side Frames assure shaft alignment and reduced wear on bearings. These and other Northwest features add up to faster, more dependable performance and higher output. Plan on a Northwest for the heart of your job.

NORTHWEST ENGINEERING CO.
1507 Field Bldg., 135 South LaSalle St.
Chicago 3, Illinois

NORTHWEST

The Crane that goes Anywhere!

4 to 44 tons capacity

Board during the war. He has been active in the Board of Trade at Washington.

▼

▶▶▶ An honorary Doctor of Engineering degree was awarded June 7 to *Walter Geist,* president of Allis-Chalmers Mfg. Company, Milwaukee, by the Michigan College of Mining and Technology at Houghton, Michigan. He also holds an honorary Doctor of Law degree from Lawrence College.

▼

▶▶▶ From the position of vice president and general sales manager, *John G. Seiler* has now been made executive vice president of Tube Turns, Inc., Louisville, Kentucky. Mr. Seiler has been associated with the company since February, 1930. A year later he was made sales manager; he was named vice president at the beginning of World War II, and became general sales manager in February, 1945.

▼

▶▶▶ Vice president of Johns-Manville Sales Corporation of New York and general sales manager of the company's Industrial Products Division, *C. G. Dandrow,* has been elected president of the Massachusetts Institute of Technology Alumni Association.

▼

▶▶▶ Chief accountant for Weyerhaeuser Timber Company's new kraft mill at Springfield, Oregon, is *M. F. Stewart,* who has been transferred from the pulp division at Longview. New shift foreman at the Longview kraft mill is *Hugh K. Wickett,* formerly a foreman with Kalamazoo Vegetable Parchment, Ltd., at Espanola, Canada.

▼

▶▶▶ Vice president in charge of operations for Mead Corporation, Chillicothe, Ohio, *Howard E. Whitaker,* has been named acting chief of the pulp and paper branch industry division of the European Relief Program.

▼

▶▶▶ At a recent election of the Western New York Safety Conference, Inc., *Wilfred J. Desjardin,* of Kimberly-Clark Corporation, Niagara Falls, New York, was made first vice president. *Merrill C. M. Pollard,* of the National Gypsum Company, Buffalo, New York, was re-elected to the board of directors of the Conference.

▼

▶▶▶ Chicago District representatives for Industrial Process Engineers (West New York, N.J.) is *Raymond J. Selwyn* of Selwyn Engineering Company who will have exclusive representation in Chicago, northern Illinois, northern Indiana, southern Wisconsin and eastern Iowa for Industrial products. The new Industrial Process office is located at 53 West Jackson Boulevard, Chicago.

▼

▶▶▶ With fifteen years of experience in the paperboard field to his credit, *R. R. Huber* has been appointed manager of the Paperboard Division of Pioneer-Flintkote, Los Angeles. He will direct operations of the Hollywood folding and set-up box plants, shipping container and boxboard departments.

▼

▶▶▶ The newly-appointed director of public relations for the National Gypsum Company, Buffalo, New York, is *David A. White, Jr.* He formerly was public relations officer for the Buffalo Regional Office of the Veterans' Administration.

▼

▶▶▶ The newly created position of manager of sales operations for the Hewitt Rubber Division, Hewitt-Robins, Inc., Buffalo, has been given to *Charles W. Mackett,* former assistant sales manager of the mechanical rubber goods division. Since joining the company in Chicago 32 years ago, he has served the organization in various sales capacities since that time.

▼

▶▶▶ Technical director at the Byron Weston Company (Dalton, Mass.) for many years, *F. S. Klein,* has been appointed mill manager. He is thoroughly familiar with all phases of production and quality control, having been associated with the company since 1935. *L. P. Taylor* has been placed in charge of new product development and sales-production co-ordination.

▼

▶▶▶ At the semiannual meeting of the Transportation Association of America held at the Union League Club, Chicago, *Alfred L. Hammell,* vice president of the Railway Express Agency, was elected a director of the Association to fill the vacancy caused by the resignation of President L. O. Head of the same company.

▼

▶▶▶ The appointment of *E. E. Bauer* as manager of its Central sales district has been announced by the Peerless Pump Division of the Food Machinery Corporation, Los Angeles. He formerly was centrifugal pump sectional sales manager, which position is now being filled by *Frank W. McCann.*

▼

▶▶▶ Chief chemist at the Corpus Christi, Texas, plant of Southern Alkali Corporation since 1934, *Gustave Heinemann,* will assume the additional duties of technical director. He formerly served as a chemical engineer for four years at Pittsburgh Plate Glass Company's alkali-producing plant at Barberton, Ohio.

▼

▶▶▶ President of the Crown Zellerbach Corporation, San Francisco, *J. David Zellerbach,* and three other men were named United States delegates by President Truman to the International Labor Conference to be held at San Francisco July 12 to 15. The delegation will be headed by David A. Morse, Under-Secretary of Labor.

▼

▶▶▶ The retirement of *J. M. Fuller* as president after sixty-two years of service with the Harrington & King Perforating Company, Chicago, has been announced. *Foye P. Hutchinson* was elected president, *Judson E. Fuller* as vice president and treasurer and *S. Harrington Jr.,* secretary.

▼

▶▶▶ A member of the sales staff of American Brake Shoe Company since 1935, *Uri B. Grannis, Jr.,* has been appointed manager of equipment sales for the American Brakeblok Division of the company. He will be located at the division headquarters in Detroit, Michigan.

▼

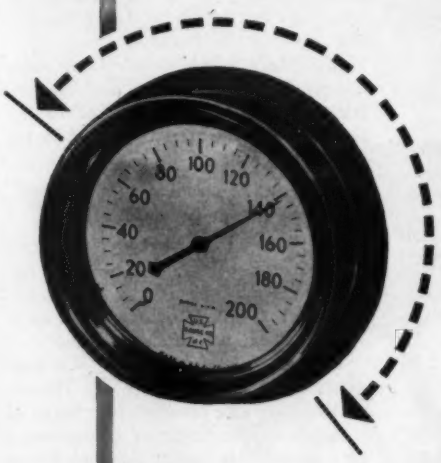
▶▶▶ *E. (Ed) L. Behrends* has joined the general sales department of Taylor Forge & Pipe Works, Chicago and Carnegie (Pa.). Formerly he was vice president of George B. Limbert Company; later he became manager of the Western Supply Division of the Lummus Company operating the former Limbert facilities.

▼

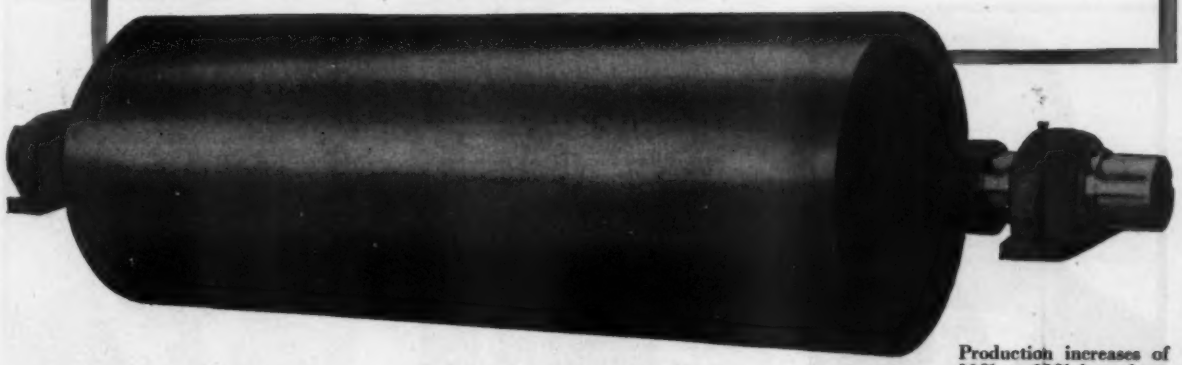
▶▶▶ Two appointments recently announced by the National Gypsum Company are: *John W. Brown,* who joined the company in 1935, has been made general sales manager. He has been manager of the Dallas district since 1941. Mr. Brown will work out of the Buffalo office. *James J. Ryan,* who has been with the company since 1934, has been appointed to the new position of general commodity manager.

▼

▶▶▶ The election of the following officers has been announced by John W. Bolton and Sons, Inc. (Lawrence, Mass.): *John Gaines Bolton,* president; *A. L. Bolton, Jr.,* treasurer; *H. D. Stuck,* vice president in charge of manufacture, and *A. C. Clarke,* vice president in charge of sales.



CAN YOU *safely* WORK YOUR DRIER ROLLS AT Higher Steam Pressures?



Production increases of 10% to 25% have been reported after Lukenweld Jacketed Drier Rolls replaced drum-type rolls.

High pressures, possible with Lukenweld Rolls, boost output

First question to ask is, "Can our old rolls be *safely* worked at higher pressures?" Some operators report unfortunate experiences when they tried; failure of rolls damaged other rolls and shut down entire machines. Often the insurance companies will not permit any increase in pressure.

Lukenweld Drier Rolls are predictable, because they are steel plate construction. Designed for pressure work—as much as 350 psi. and over—they are SAFE. Ask your insurance company what they know about Lukenweld Drier Rolls.

Positive removal of condensate and the higher steam velocity obtained with Lukenweld Jacketed Drier Rolls make them better workers at any steam pressure. Reduction of film, dead steam, entrapped air or other noncondensable gases contributes to their high efficiency. Temperatures are more even across roll faces.

Lukenweld Jacketed Drier Rolls are offered in diameters from two feet to over twenty feet. They are described in Bulletin 358. For a copy, write Lukenweld, Division of Lukens Steel Company, 408 Lukens Bldg., Coatesville, Pa.

LUKENS
LUKENWELD DIVISION

LUKENWELD
DRIER ROLLS AND DRYING MACHINERY

• • SPEED SCRAP TO THE MILLS TO MAKE MORE STEEL • •

NECROLOGY

AGNER B. HANSEN

President and general manager of Northern Paper Mills, Green Bay, Wisconsin, Agner B. Hansen, passed away July 4 at the age of 52. He had been ill but a few days.

Mr. Hansen was prominent in the field of paper manufacture. He was born in Racine, Wisconsin, and was graduated from Thiel College, Greenville, Pennsylvania. In addition, he took postgraduate work at the University of Wisconsin and the Chicago University.

During World War I, Mr. Hansen served as an ensign in the Navy, and following the war he taught chemistry at Marinette (Wis.) High School until

Agner B. Hansen

1922. At that time, he was appointed chief chemist of the Marinette and Menominee Paper Company. In 1929, he was promoted to mill manager, in which capacity he worked until 1935 when he became general manager of the Northern Paper Mills following a reorganization of the company. Two years later, he was named executive vice president of the Northern plant and in 1941, he was appointed president and general manager of that concern. In addition, he was a director of a number of Northern's subsidiaries and a director of the Falls Paper and Power Company of Oconto Falls, Wisconsin.

Mr. Hansen was an honorary member of the American Pulp and Paper Mill Superintendents Association and a member of the Technical Association of the Pulp and Paper Industry. During the recent war, he was on leave from Northern for six months, during which time he served as deputy administrator of the Pulp and Paper Division of the War Production Board.

▼

▶▶▶ Assistant treasurer of the St. Croix Paper Company (Woodland, Me.), *Charles M. Ready*, passed away June 13 at his home in Medford, Massachusetts, at the age of 68. He had been employed by the company for most of his working life and was recently attached to its Boston office. He is survived by three sisters and a brother.

▼

G. J. ARMBRUSTER

Former superintendent of the Soundview Pulp Company, Everett, Washington, G. J. Armbruster, passed away July 3, at the age of 67.

From the time of its founding in 1930 until his retirement in March, 1946, Mr. Armbruster filled the position of mill superintendent at Soundview. He is survived by his widow, a son and two daughters.

▼

▶▶▶ Special Western representative for the Wyandotte Chemicals Corporation (Wyandotte, Mich.), *Carl Van Laaten*, passed away in Chicago May 8 at the age of 58. In 1909 he entered the employ of Edward Hill's Son & Company, later serving as manager of its Chicago, St. Louis and Cincinnati territories and then in the same capacity for the Michigan Alkali Company, which preceded the Wyandotte Chemicals Corporation.

▼

H. LESTER PADDOCK

H. Lester Paddock, dean of the central New York papermaking industry, passed away June 22 at the age of 88.

Mr. Paddock was chairman of the board of directors of the Oswego Falls Corporation, which operates a paper and pulp mill at Fulton, New York, the development of which he directed. He was also the board chairman of Sealright Company, Inc., of Fulton, which he supported to convert the products of his paperboard mill into a nationally-known line of containers and milk bottle closures.

A native of Wolcott, New York, Mr. Paddock started his career with a Wolcott banking firm and later went into the wholesale hardware business in Rochester. In the late Eighties, he became vice president of the Lakeside Paper Company of Skaneateles, New York, and he was an incorporator of the original Oswego Falls Pulp and Paper Company in Fulton. In 1894 he moved to Fulton and later became president and general manager of the Oswego Falls Corporation, a post which he held for 40 years until he retired as operating head and became chairman of the board.

Mr. Paddock was a prominent community leader in Fulton, and he supported many activities outside of the paper industry. He is survived by his daughter.

▼

E. A. THROCKMORTON

On June 7, slightly more than two years after he became head of Container Laboratories, Inc., Chicago, Edgerton A. Throckmorton passed away suddenly. He was 46 years of age.

Prior to his connection with the Laboratories on June 1, 1946, Mr. Throckmorton was vice president in charge of research for the Container Corporation of America. He became associated with that company in 1931. Formerly, he

Edgerton A. Throckmorton

had been in an official position with the Sefton Manufacturing Company.

During the war, Mr. Throckmorton served as packaging consultant with the W.P.B. He is survived by his widow, two sons and three daughters.

▼

▶▶▶ Former superintendent of the St. Regis Paper Company, *William J. Palmer*, passed away at his home in Waddington, New York, July 4. He was 78 years of age. Mr. Palmer had had many years of experience as construction engineer with paper companies in Lyons Falls and Carthage. His last connection was that of superintendent of the Waddington pulp terminal of the St. Regis Paper Company and at its mills in Norfolk and Raymondville.

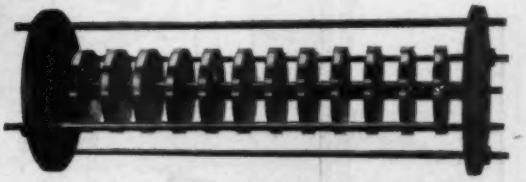
Where metal meets corrosion

IT'S A JOB FOR Chemalloy

This illustration of a turbine runner shows the broad scope of Chemalloy for corrosion applications. This particular 1600-pound, 35.5-inch, Chemalloy casting is used in water to resist oxidizing mineral and organic acids that corrode ordinary metals. But no matter what your corrosion problem is, where metal meets corrosion, it's a job for Chemalloy.

Size, weight or form make no difference. It's the combination of correct corrosion-resistant alloy, proper casting design and modern foundry technique that are the important factors. It's the quality, inside and out, of finished alloyed castings—their success in resisting corrosion—their *good results* on the job, that count.

You buy *good results* when you specify Chemalloy. For an individual alloy recommendation, send full particulars of your corrosion problem to Electro-Alloys Division, Elyria, Ohio.



These Test Discs Solve Special Corrosion Problems. If studies of your alloy requirements do not supply sufficient information on which to base alloy recommendations, these test discs are put to work in your plant. Exposed to actual service conditions under which your castings will be used—they determine the correct alloy for your job.

SPECIFY **CHEMALLOY** FOR CORROSION RESISTANCE... **THERMALLOY** FOR HEAT AND ABRASION RESISTANCE...

Mixer Arms • Filter Drums • Fittings • Dryer Parts

AMERICAN Brake Shoe COMPANY

ELECTRO-ALLOYS DIVISION
ELYRIA, OHIO

"Get it from CRANE"

...piping equipment for every need

It's a good slogan to remember—whether you need valves, fittings, pipe line accessories, or pipe. For the complete Crane line offers the world's widest choice of quality piping equipment—in brass, iron, steel, or alloy materials.

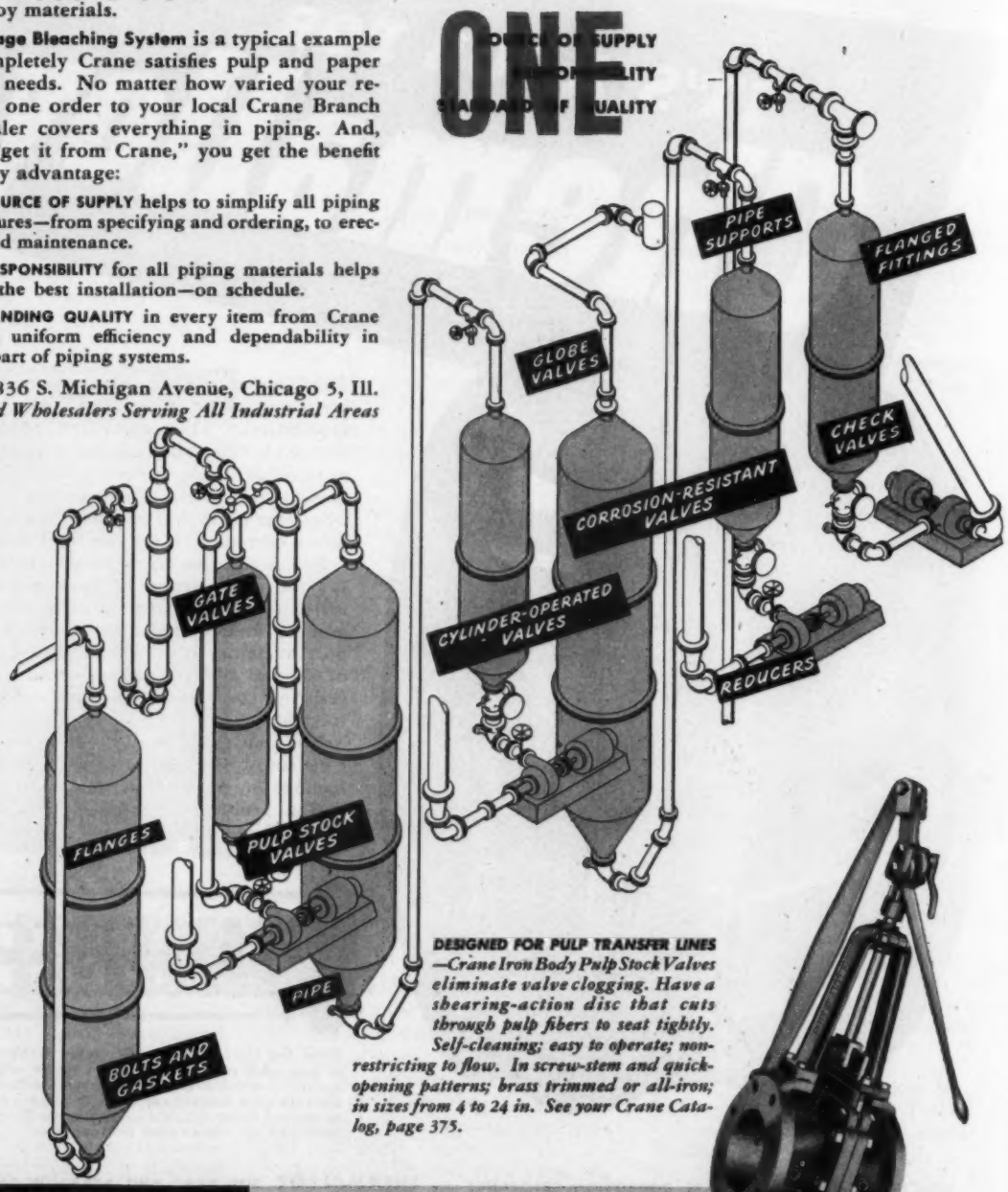
This Multi-stage Bleaching System is a typical example of how completely Crane satisfies pulp and paper mill piping needs. No matter how varied your requirements, one order to your local Crane Branch or Wholesaler covers everything in piping. And, when you "get it from Crane," you get the benefit of this 3-way advantage:

ONE SOURCE OF SUPPLY helps to simplify all piping procedures—from specifying and ordering, to erection and maintenance.

ONE RESPONSIBILITY for all piping materials helps to get the best installation—on schedule.

OUTSTANDING QUALITY in every item from Crane assures uniform efficiency and dependability in every part of piping systems.

Crane Co., 836 S. Michigan Avenue, Chicago 5, Ill.
Branches and Wholesalers Serving All Industrial Areas



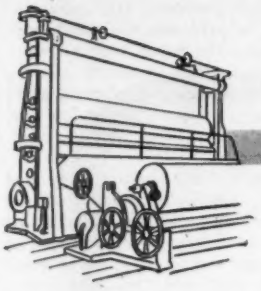
DESIGNED FOR PULP TRANSFER LINES
—Crane Iron Body Pulp Stock Valves eliminate valve clogging. Have a shearing-action disc that cuts through pulp fibers to seat tightly. Self-cleaning; easy to operate; non-restricting to flow. In screw-stem and quick-opening patterns; brass trimmed or all-iron; in sizes from 4 to 24 in. See your Crane Catalog, page 375.

EVERYTHING FROM . . .

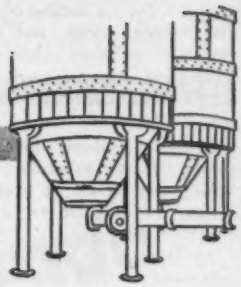
VALVES • FITTINGS
PIPE • PLUMBING
AND HEATING

CRANE

FOR EVERY PIPING SYSTEM



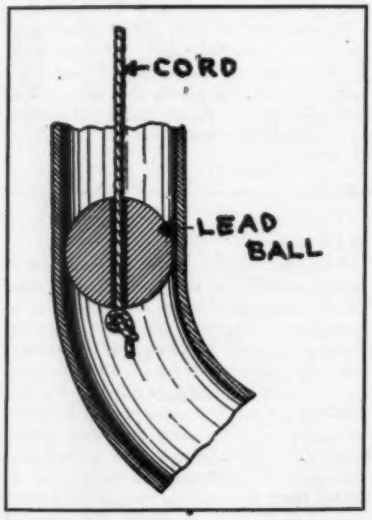
Practical SHORTS



Readers are invited to submit short, practical articles for this department. The items should be original and should relate to ways and means of handling production and maintenance jobs. Where possible, articles should be illustrated. Rough sketches only are required. Payment will be made for acceptable items upon publication.

How to Pull Wire, Rope, Etc., through Pipes, Tubes, Etc.

The best scheme this writer has used for pulling rope, wire, chains, etc. through fixtures, pipe, etc., is to start a small thread or cord through the opening attached to a lead ball, as shown in the accompanying sketch. The hole is easily made by drilling, or, if sufficient care is exercised, a steel



needle can be driven through in the same way that a steel needle can be driven through a coin by using a cork. Make the knot small enough so that the cord won't catch ahead of the lead ball. After the first cord is pulled through, the remainder of the operation is easy. Keep the lead ball in your kit for possible future use.—W. F. SCHAPHORST, M.E.

▼

Procedure for Taking Boilers Off Line

When a boiler is taken off line, it is highly desirable that any suspended solids or mud present in the boiler water be prevented from baking in place and air drying into an adherent deposit. To maintain the boiler in a clean condition, the following procedure is recommended:

A boiler should never be drained while there still is sufficient heat to bake sludge on the boiler tubes without immediately washing the boiler.

When the boiler has been taken off the line and as it is cooling, the boiler should be blown down heavily and filled with hot feed water. This operation of blow and fill should be repeated several times and as frequently as possible, particularly when the boiler water is high in suspended solids, until the boiler is cooled and ready to open.

Immediately on draining the boiler, the manhole or manholes should be knocked in and a high pressure hose employed to wash out sludge. By this procedure, the sludge can be washed out while still in a fluid form. If you are not ready to wash out the boiler immediately on draining, there may still be sufficient heat left in the boiler setting to cause baking of residual sludge and therefore the boiler should not be drained. However, never leave the boiler filled with water for any extended period of time without taking proper measures to prevent corrosion and pitting during this period.

If the boiler is not properly removed from the line, the soft sludge will dry out and will bake on the tubes and it may then be necessary to turbine the tubes in order to remove this baked sludge.—W. H. & L. D. BETZ.

▼

How to Hold a Small Drill in a Brace-and-Bit Chuck

Every reader has doubtless had difficulty trying to hold a small drill in an ordinary brace-and-bit-chuck. The sketches herewith show the writer's method. Saw two slits, C and D, at right angles in a 3/16 in. rod E, of suitable length, which has first been turned down in "steps" as shown in the sketch at the right in Figure 1. Then insert the split piece E in the chuck F, at the suitable holding point, insert the drill G, and clamp, as shown in Figure 2.

Care must be exercised in sawing to do the work accurately so that the drill will center as closely as possible. The slit, as will be noted, does not cut the piece E into four parts. That is, the extreme right end, Figures 1, remains solid. Piece E is shown larger than 3/16-in. in these sketches in order to make the idea perfectly clear.—W. F. SCHAPHORST, M.E.

▼

Classification of Cutting Fluids

There are two general types of cutting fluids—compounded cutting oils, and soluble (or emulsifiable) oils.

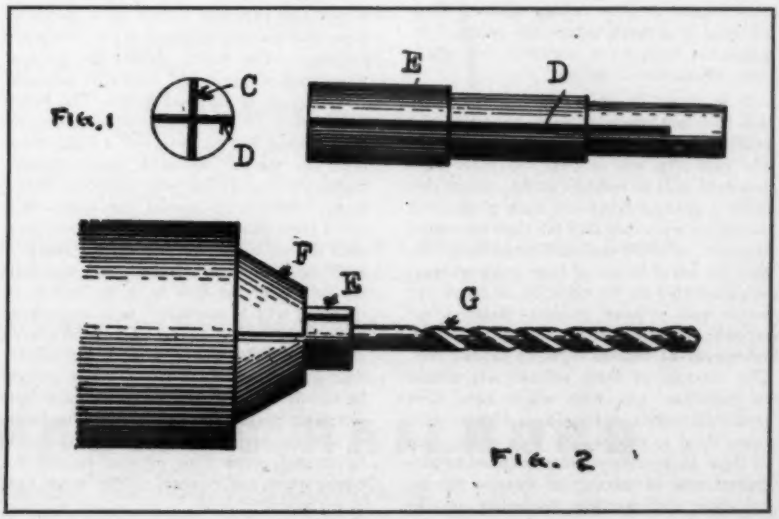
Cutting Oils

Cutting oils, which represent one of the two general classifications of cutting fluids, may be subdivided broadly into six groups, which are associated with types of application and usage:

1) Lard oil, sulphur and chlorine (active) compounds. For the most severe operations on the hardest cutting steels and for thread grinding.

2) Lard oil and sulphur (active) compounds. For severe operations and on harder cutting steels on various operations.

3) Lard oil and sulphur (passive) com-



pounds. For all cutting operations on the easier cutting steels, and for less severe operations on harder cutting steels.

4) Lard oil compounds (mineral lard oils). Principally for metals other than steel.

5) Mineral oil and sulphur (active) compound. For use on medium and low carbon steels when speed of production and/or accuracy of finish are not an important consideration.

6) Mineral oil (petroleum oil without compound). Used for machining non-ferrous-type metals, such as magnesium. Also used as a blending oil (or diluent) to adjust active compounds to a composition suited for specific requirements of less severity than those for which the purchased compounded oil is capable.

Each type and grade of cutting oil has definite properties, to fit it specifically, and in preference to others, for particular operations. However, seldom does a manufacturing plant purchase a separate oil for each of the many cutting operations to be served. In the interest of minimum inventory and flexibility with respect to variations in requirements, it is often the practice in large shops to use one or a few grades of cutting oil, which can be modified by the addition of light mineral oil for different operations. In such instances the cutting oils stocked would be active types adapted to the more difficult cutting requirements; these can be blended with petroleum oil of proper viscosity to grades of lesser compound and additive strength adequate for less severe operations. Under other circumstances where a difficult operation is in minority with respect to total production, the cutting oil suited to majority requirements may be made to serve effectively on difficult jobs by reducing depth of cut and speed. The selection of cutting oils to be purchased thus may entail more than an analysis of the requirements of the different operations, and will give consideration to the practical and economy aspects of handling and storage.

Soluble Oils

Soluble oils are in a different classification, since they are not used as received, but are mixed with water, and the emulsions thus formed are the cutting fluids. They are used principally where the primary requirement calls for a coolant, and where little lubrication is needed.

It is generally agreed that plain water was the first medium used to offset the generation of frictional heat in metal cutting. The next step was to treat the water with dissolved soda to reduce rusting. From this point a gradual transition took place; first the use of saponified lard oil, then saponified mixtures of lard oil and petroleum oil, next the use of blends of fatty and petroleum oils converted by the addition of soaps and water into a paste product designed for saponifying with water, and finally the development of various types of soluble oils. The majority of these soluble oils consist of petroleum oils with which have been combined emulsion-forming additives that cause them to mix readily with water. All of these advancements were intended to give greater ease of mixing; to increase the lubricating and wetting properties of the emulsion; and to decrease the possibility of rusting steel or corroding non-ferrous metals.

Analysis and laboratory test methods are not of themselves a reliable guide to performance of soluble oils in service; in fact, there has not yet been developed a satisfactory method to correlate laboratory tests and performance tests. Under the circumstances, soluble oil specifications are usually related to formula or composition of the product.

Soluble oils are mixed with water in the ratio of 1 part of oil to 10 parts of water up to 1 to 100 for use as cutting or grinding fluids. These mixtures are low in cost. They function primarily as coolants, and their wetting and lubricating quality decreases as the water dilution increases.

Method of Mixing

In mixing, the soluble oil should always be added to the water rather than the reverse. Adding water to the oil or using an insufficient quantity of water may cause an "invert" emulsion in which the droplets of water are surrounded by oil instead of droplets of oil being surrounded by water. The result is a slimy or pasty mixture that is inefficient in performance and which should be discarded.

Where hard water is encountered, ordinary soluble oils do not mix perfectly. In the Midwest, water often ranges between 12 and 56 grain hardness. The most economical way to overcome this difficulty is by first treating the water with a proper quantity of alkali. The alternative is to use a soluble oil containing a softening agent or containing a sufficient excess of the emulsifying agent to insure a stable emulsion.

The leanest mixtures are commonly used for grinding operations. Rich mixtures would tend to clog the pores of grinding wheels and cause them to skid instead of grind. The grit size of the grinding wheel must also be taken into consideration, as a wheel with a coarse grit makes a heavier cut and consequently requires a richer mixture than a fine grit wheel in order to get the desired finish. The grinding of harder metal requires less lubricating properties of the emulsion and more heat dissipation, as there is less tendency for the metal to wipe or draw; therefore, a much leaner mixture should then be employed. In order to maintain the desired finish, the grinding wheel must be prevented, by the emulsion, from picking up dirt, grindings and abrasive; as a wheel that is so loaded becomes glazed and impairs accuracy and finish. The flow of the emulsion must be directed in sufficient force to move these minute particles away from the wheel. Of great benefit is a reservoir large enough and with sufficient baffles to enable this silt to settle out. *The Service Factor*, published by SINCLAIR REFINING COMPANY.

Procedure for Laying Up Boilers

When boilers are taken out of service for any length of time, corrosion may occur on the internal surfaces of the boilers unless certain precautions are observed. During periods of idleness, boilers may be laid up by one of the two methods described below. The choice of method is dependent on how long the boiler is to be out of service, and how quickly the boiler may be required back in service for regular steaming purposes in an emergency, etc.

The Dry Method

The dry method is preferable when a boiler is to be out of service for a month or more and will not be required for emergency purposes. The boiler should be drained, thoroughly cleaned and carefully inspected to insure all is in good order. The boiler should then be thoroughly dried internally by means of hot air stoves or a light wood fire. An amount of quick lime, approximately 30 pounds for each 100 boiler horsepower should be spread on water-tight, wood trays placed in the boiler immediately after the drying-out process. If the boiler is HRT or locomotive type, a single tray resting on top of the flues or in the bottom of the shell will be adequate. In a multi-drum water tube boiler, a tray should be placed in each drum. The manheads, handholes and all connections on the boiler should be tightly blanked or closed after the lime has been placed in position. If the boiler is idle for a considerable period, it should be opened every three or four months for examination and renewal of the quick lime if necessary.

The Wet Method

The wet method should be employed if boilers must be left idle for a period longer than a week with water in them, so as to constitute emergency service if required. The boiler should be thoroughly cleaned and carefully inspected to insure all is in good order. After the boiler is filled to the normal water level, the water should be boiled with the boiler properly vented to atmosphere for a short period. This procedure is necessary to expel the dissolved gases released from the water by boiling. The water should then be made alkaline in excess of 400 ppm by the use of caustic soda (approximately 3 pounds of caustic soda per 1000 gallons of water in the boiler). In addition, sufficient sodium sulphite should be added to the boiler water to produce a minimum residual sulphite content of 100 ppm (approximately 1.5 pounds of sodium sulphite per 1000 gallons of water in the boiler). After the boiler is cooled somewhat, but before a vacuum is created, the boiler should be filled completely and all connections closed. At weekly intervals, tests of the water should be made and the alkalinity and sulphite concentrations increased if necessary to maintain the recommended concentrations. It is advisable to keep the water in the boiler as cold as possible. Corrosion is promoted by lukewarm water. For this reason, feed valves and all steam connections should be tight at all times.

If it is necessary for such an idle boiler to be returned to service, the boiler should be blown down well before placing on line in order to reduce boiler water alkalinity and prevent carryover.—W. H. & L. D. BETZ.

UNION PACIFIC

The Governor of Colorado *invites You*

THE STATE OF COLORADO
EXECUTIVE CHAMBERS
DENVER

WILLIAM LEE KNOUS
GOVERNOR

To American Industry:

Look long at Colorado.

A vigorous, young state, awake to its opportunities yet aware of its needs, will challenge your attention and stimulate your imagination.

Natural resources we have in abundance with the water and power for their development. Our labor force is highly adaptable, our markets are rapidly expanding.

Our health-giving climate, our scenic setting make Colorado a soul-satisfying home for you and your families.

And most important — we know where we're going! Our leaders in business, industry, agriculture and education, through their Resources Development Council, are charting a course toward a sound, stable future for our people.

Look long at Colorado — it offers you much!

Lee Knous
Governor

Lee Knous

* One of a series of advertisements based on industrial opportunities in the states served by Union Pacific Railroad.

Unite with Union Pacific in selecting sites and seeking new markets in California, Colorado, Idaho, Kansas, Montana, Nebraska, Nevada, Oregon, Utah, Washington, Wyoming.

*Address Industrial Department, Union Pacific Railroad
Omaha 2, Nebraska

UNION PACIFIC RAILROAD
Road of the Daily Streamliners

Tailored Adhesives for Corrugated Board

JOHN H. WILLS
Philadelphia Quartz Co.

The sodium silicate-clay adhesives used in the manufacture of corrugated board were tailored to the requirements of the industry through a knowledge of the physical properties of sodium silicate solutions. Adhesive solutions may be varied to contain proportions of alkali to silica within the limits of about 1 Na_2O to 2 SiO_2 and 1 Na_2O to 4 SiO_2. They are usually defined by this ratio and their concentration.

The new adhesives vary from the earlier sodium silicate adhesives by the use of a more dilute liquid phase and the addition of clay. Usually the liquid phase is also of higher ratio.

The use of a more dilute liquid phase has several advantages. For instance, strongest bonds are not produced by the most concentrated grades but bond strength passes through a maximum. In addition the dilute liquid phase allows more rapid wetting and better bonding with highly calendered and hard sized board which has come into general use. The curve in Figure 1 represents the relative time of wetting a standard form of paper, No. 42 Whatman filter paper, by a series of dilutions of sodium silicates at the limiting SiO_2:Na_2O ratio used commercially.

Even in dilute solutions containing 1 per cent Na_2O, Liddiard (*Chemical Age*, p. 341-5, October, 1944) found that the surface tension was decreased and ease of wetting accordingly increased by the use of the higher ratio sodium silicates which have a higher proportion of colloidal SiO_2. His results showing how the wetting coefficient varies with the mol ratio are given in Figure 2.

Abridgments in this section are from papers presented at the annual meeting of the Technical Association of the Pulp and Paper Industry held in New York City, February 23-26, 1948.

As Vail and Baker (U. S. pat. 2,239,358, April 22, 1941) point out, the addition of clay to sodium silicate adhesives accomplishes several things. In the first place, it lowers the over-all water loss required for the same spread of adhesive which is more or less obvious from the mathematics. It decreases alkali migration by means of its high surface absorption. These, along with the thixotropic properties which the clay gives to the mixture, increase the rapidity with which such a solution reaches its initial set. Thixotropy is the term for materials which tend to gel, e.g. show resistance to flow after standing still but become quite liquid again when shaken. This property depends largely on concentration so that as the water is lost the remaining adhesive becomes more and more thixotropic in character and the gel strength developed contributes greatly to an early initial set.

An idea of the gel strength of these thixotropic adhesives has been sought in various ways. The data shown in Figure 4 were obtained by extra-polating yield points from Stormer viscometer data and give a general idea of the nature of the relationship. Another advantage of the high gel strength is that a bond which has been disturbed will reform more readily than is the case with ordinary silica adhesives.

The addition of clay also tends to form a barrier against the loss of a dilute adhesive into the paper and yet permits control of penetration to the optimum depth of 0.002 inch. The liquid phase initially is able to strike into dense surfaces and form a bond but the clay particles quickly cover the pores of the paper and contain the residual silicate phase thus reducing the total amount of sodium silicate in the liner itself and insuring a good sturdy bond.

The choice of adhesive formulation and paper are evidently inter-related. It has been calculated by Camp-Campins (*Paper Trade J.* 110, No. 8: 120-121, 1940; *Tech. Assoc. Papers* 23: 303-305, 1940) that jute has less than 1 cubic foot of air for each cubic foot of air free paper while dry finish fourdrinier kraft has 2 cubic feet of air. It, therefore, has larger pores, and larger capillaries tend to absorb liquid more slowly. On the other hand, they take in larger amounts of adhesive and penetration is more rapid. It is this tendency toward larger pores in paper liners which has made the combination of film forming property and fast wetting so important in modern corrugating adhesives and sodium silicate-clay adhesives have both of these properties.

Those familiar with ceramics and paper coating are well aware of the great variation in clay from different sources. Naturally, then not all clays will give the same viscosity and other effects with sodium silicate. In general, a kaolin clay seems preferable and careful tests of proposed supplies must

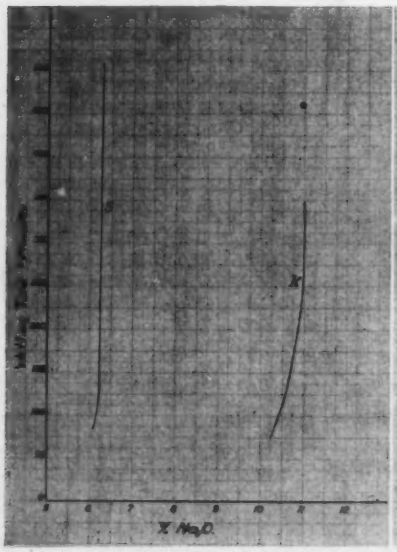


Fig. 1 (left)—The relation of per cent Na_2O and ratio of sodium silicate to the time required to wet No. 40 Whatman filter paper sufficiently to sink under a standard weight.
"S" ratio by weight 1 Na_2O : 3.9 SiO_2
"K" ratio by weight 1 Na_2O : 2.9 SiO_2

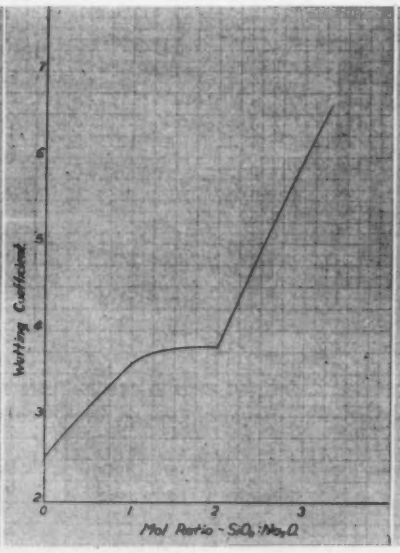


Fig. 2 (center)—Relation of wetting coefficient to the mol ratio as determined by Liddiard for dilute sodium silicates (1 per cent Na_2O) on glass

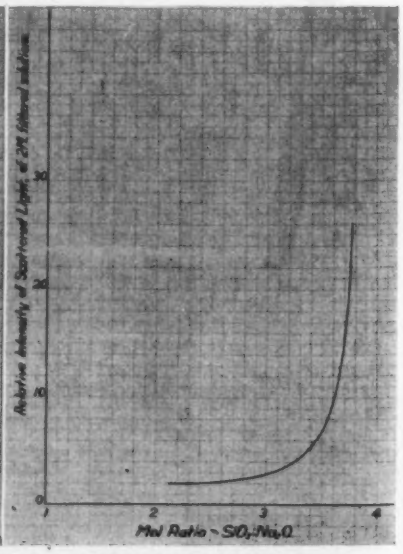


Fig. 6 (right)—Variation of the intensity of scattered light with change in mol ratio as determined by Burgess and Krishnamurti

MEMO TO PRESIDENTS WHO WATCHED THE BAND GO BY!

HERE'S ONE parade that isn't "all over but the shouting" after the band has passed. It's the Payroll Savings Plan for the regular purchase of U. S. Security Bonds by employees.

Though the formal spring campaign to sell Bonds is over, any company can still move forward with the parade. Right now thousands of companies are putting *additional push* behind their Payroll Savings Plans. Managements of many companies that have not yet participated are *now installing* the Plan.

It's a "look-ahead" plan, that benefits employee, company, and nation. Every $3 invested in Bonds pay $4 at maturity. Personnel records in the plants with active P. S. P. programs show improved employee attitudes—evidenced by less absenteeism and fewer accidents—as the individual's sense of security grows with Bond purchases. And every Security Bond dollar built up in the Treasury retires a dollar of the national debt that is potentially inflationary. It means less bidding-up of prices. Moreover, Bond buyers are better citizens because they have a tangible stake in the nation's future.

It's just as easy to take action now as when the campaign was at its height. Just call your Treasury Department's State Director, Savings Bonds Division, and ask for the material that helps to get a Payroll Plan started or to keep it rolling.

The Treasury Department acknowledges with appreciation the publication of this message by

The Paper Industry and Paper World

This is an official U. S. Treasury advertisement prepared under the auspices of the Treasury Department and the Advertising Council.

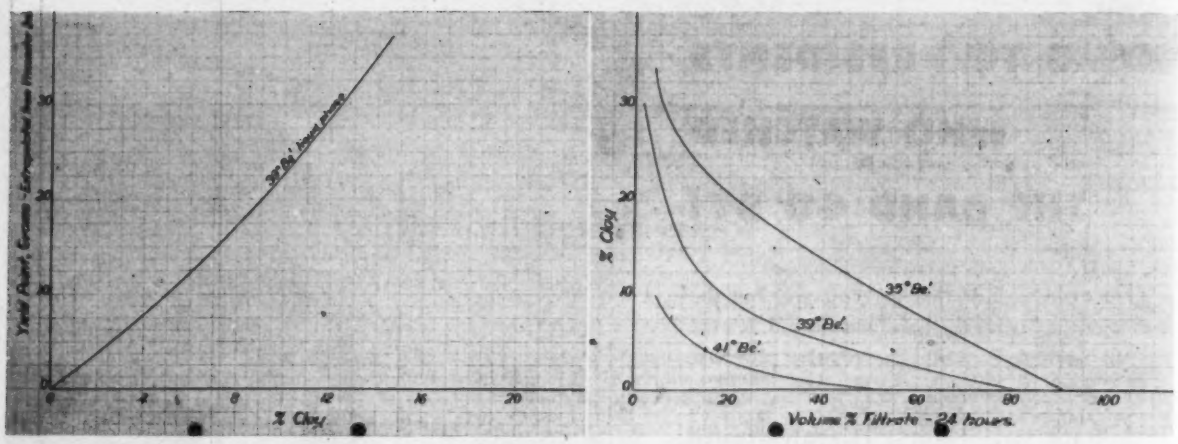


Fig. 4 (left)—The effect of clay on the yield point of sodium silicate-clay adhesives as determined from Stormer viscometer data . . . Fig. 5 (right)—The relation of clay content, specific gravity of the liquid phase and filtration volume for sodium silicate-clay adhesives at 20 C.

be made to determine that which will be most economical in terms of final clay content and mixing costs.

The use of higher ratio silicates takes advantage of the increased colloidal nature of such solutions. It is rather well known that as the ratio increases above about 3 of SiO_2 to 1 of Na_2O the larger percentage of the silica is present as colloidal micelles or particles which absorb some but not all of the alkali present. Some of the alkali at least is ionized from the surfaces of the micelles leaving charges which stabilize the colloidal suspension. Figure 6 *(page 616)*

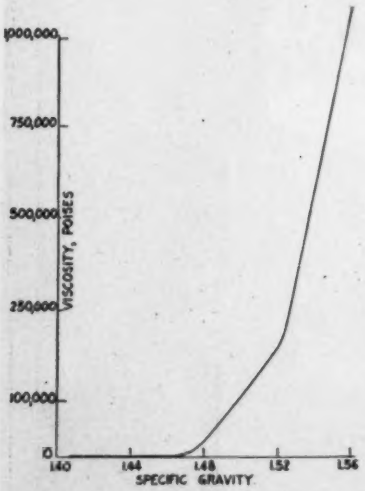


Fig. 7—The change in viscosity of a 1 Na_2O : 3.22 SiO_2 sodium silicate at room temperature as water is lost

shows the relative intensity of light scattered by filtered commercial silicates containing 2M SiO_2 as determined by Burgess et al. (*Trans. Far. Soc.* 26, 574, 1920). The scattering is directly proportional to the number and size of the colloidal particles. The colloidal nature of the solutions quickly increases above a ratio of about 3.

Higher ratio silicates also require a lower water loss to obtain initial set. Attempts to find the composition of the adhesive at initial set have not been conclusive. The method which was used here involves the determination of the viscosity-concentration relation shown in the accompanying Figure 7. There is evidently a sharp knee ending in the region of about 40,000 poises. Also in this viscosity region a conchoidal fracture is first observed. The rate of change of increase also seems to be a maximum hereabouts. For these reasons, it is construed that initial set has occurred. Above this region, there appears to be another break which may mean the formation of a gel structure as the further rate of increase is fairly constant and very rapid. It is assumed that this slope would continue to the formation of a true glass.

Presuming that 40,000 poises is required for initial set in this ratio range, the accompanying Figure 8 shows the proportionate loss required for initial set for a silicate-clay adhesive compared to the liquid phase sodium silicate. Higher ratios show a more rapid loss of water and a lower equilibrium water content. Partly because of the lower equilibrium water content, and partly because of the greater colloidal character, the higher ratio silicates when dried show a somewhat greater water resistance.

The fact that the adhesives set with the lower moisture loss makes it possible to use this sodium silicate-clay adhesive on board which is originally damper or to provide a drier, flatter board at the take-off.

The matter of an apparently small difference in loss of water to bring about initial set in the case of one adhesive compared to another may be of considerable importance. For instance, if 10 per cent of clay is added to an adhesive which loses 12 pounds of water from 100 pounds of sodium silicate solution only 10.8 pounds of water loss will be required for initial set of the mixture. This will be aside from any effect of the thixotropic character of such solutions. Presuming that 20 pounds of adhesive may be applied to 1,000 sq. ft. of single glue line, only 2.2 pounds of water will be lost to obtain initial set. At equilibrium the structure will contain about 10 per cent of water. Assuming that 16-point liner and 9-point

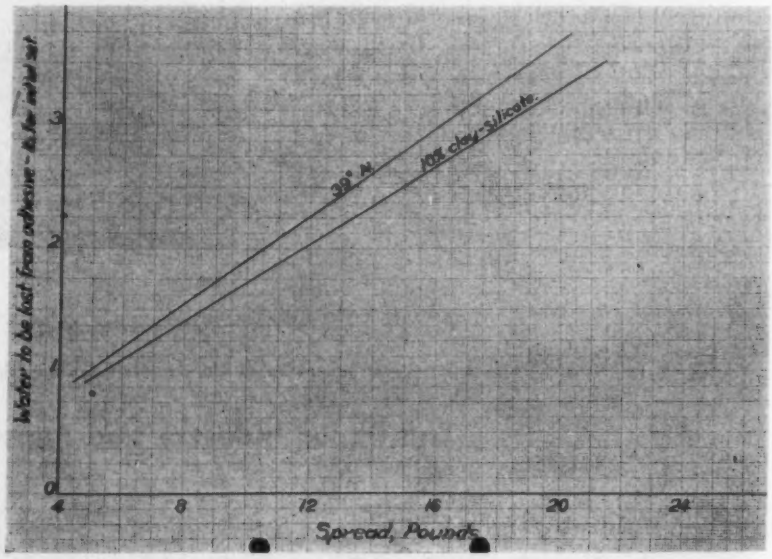


Fig. 8—The effect of clay on the water loss required for initial set

ACCURATE AND DEPENDABLE

for Positive Regulation and Close Control

● Stickle Valves for regulating and reducing pressures supply the completely effective results desired when both production efficiency and uniformity of quality depend upon the control of steam within extremely close limits. Stickle Valves meet all requirements for sensitivity, accuracy, and positive performance. They are specifically designed to meet the exacting requirements of Stickle Paper Drying Systems and for other purposes involving complicated pressure regulation. Stickle Valves are uncomplicated, precision made, and ruggedly built. They are available in two series designs in all standard types, and a wide range of sizes.

Series 400 Valves

Single-seated, balanced valves in lever operated, lever and weight loaded, diaphragm operated, and spring loaded, diaphragm operated types. Line shown in Bulletin No. 435 with specifications and engineering data.

Series 200 Valves

Double-seated, semi-balanced valves, both self-contained and pilot operated, in standard types. Bulletin No. 235 illustrates line and supplies specifications and engineering information.

For information on the complete line of Stickle Equipment for paper mills including automatic paper drying systems, differential drainage systems and differential boiler return systems, ask for Bulletin No. 160.

STICKLE STEAM SPECIALTIES COMPANY
2215 Valley Avenue • INDIANAPOLIS 18, INDIANA

Successfully Serving Paper and Paper Board Mills for More than 40 Years

STICKLE EQUIPMENT

• Supplies Rapid Circulation of Steam through Dryers • Provides Rapid Removal of Condensate and Gases • Increases Production • Eliminates Steam Waste • Reduces Drying Pressure to Minimum • Improves Quality of Product • Gives Visible Operation of Dryers • Provides Sensitive Automatic Control • Assures Accurate Modulated Temperature • Holds Moisture to Predetermined Content.

KNIVES ALWAYS SHARP

. . . As Good As New with

ROGERS KNIFE GRINDERS

Specially Designed and Built for Low Cost Continuous Service by the Paper Industry

TYPE NT

GRINDS Wet or Dry Flat or Concave

A cabinet base, precision-built grinder, designed to give you heavy-duty performance with keen-edged accuracy. Has massive bed and carriage with 5" "V"-Ways, heavy backbase, quick-setting knife gauges and automatic oiling system. 7½ H.P. motor provides extra power. Results highly dependable—cost reasonable. 7 sizes: 48", 78", 90", 102", 110", 134", 160". Write for Bulletin NT.

NT Automatic Oiling System

. . . for "V"-Ways and transmission bearings, an exclusive Rogers feature, protects vital working parts—assures precision grinding, minimum maintenance and long life.

Rogers CC-3 Circular Knife Grinder

A rugged, cabinet base, floortype grinder for slitters—top and bottom, from 2" to 20" diameter. Three single hand wheel adjustments are all that is needed to obtain "Rogers Sharp" accuracy. A real cost and time saver that every mill should have. Special attachment available for mounting heavy bottom slitters used on paper machines—an exclusive Rogers feature. Write for Bulletin CC-3.

Backed by over 60 years experience.

SAMUEL C. ROGERS & CO.

165 Dutton Ave. Buffalo 11, N. Y.

ROGERS KNIFE GRINDERS
PRECISION QUALITY SINCE 1887

DO YOU KNOW the COAL for LOWEST STEAM COSTS?

Coal selection, like the weather, has long been a matter of great discussion. But unlike the weather, proper coal selection is a problem Seneca can do something about!

A Seneca plant survey is the answer. You simply fill out our form listing such plant information as type of equipment, load conditions, railroad delivery. Seneca Engineers, skilled and experienced in the selection of fuel for highest efficiency at lowest operation cost, make their recommendation.

This service is free. There is no selling angle, no obligation. Since Seneca handles all types of coal, Seneca is in a position to give unbiased advice.

Send for a

SENECA PLANT SURVEY

form today.

SENECA COAL & IRON CORPORATION

Norfolk • Boston • Chicago

90 WEST STREET NEW YORK

corrugating medium has been used the paper adhered will contain about 7.5 pounds of water. Paper will become damp and flabby at approximately 15 per cent water content and unseasoned rolls from mills may have as much as 12 per cent or more water. When 2.2 pounds of water are added by the adhesives to that already present in the paper at a content of 12 per cent water, there will be 11.3 pounds of water or 15.1 per cent. The board is just bordering on a flabby, damp state. Slight reductions in the water are of great importance and when it is recognized that warp is caused by the relative water content of the single-face and double-face liner, it is evident that warp itself may be even more affected by small differences in water content.

The paths by which water may be lost have often been discussed. With A-flute board there is about 7 cubic feet of air space available for each glue line for every thousand square feet of board. At 50 per cent relative humidity and 20 C., 0.006 pounds of water will be present for each cubic foot whereas at 80 C. and 100 per cent relative humidity 0.0183 pounds are present. Therefore, only 0.013 pounds are required to reach saturation for each cubic foot of air space. It is evident that in ordinary methods of operation where the air is not changed rapidly, comparatively little water can be removed from the glue line in this way but where ventilation is provided much larger weights can be removed.

By far the most of the 1 to 1.5 pounds of water which must be lost for initial set is lost by absorption into the paper at the higher relative humidities produced. Gradual evaporation through the paper and differential absorption of water leaving the alkali and silica at higher concentrations near the interface also will have some effect.

Economic Considerations of Feed Water Conditioning

F. N. KEMMER

Cochrane Corporation

The important considerations in the selection of feed water conditioning systems concern the reduction of hardness, alkalinity, total solids, and silica.

Not so long ago sludge was considered a part of boiler water. The absence of sludge was taken as an indication that hardness in the feed water was forming scale. The effect of sludge on circulation rates and the influence of suspended solids in inducing carry-over makes it desirable to keep the boiler water free of sludge, especially for operation over 1200 psi. "Zero by the soap test" is not good enough for high pressure boiler feed, it being required for such service that the feed water hardness be less than 1 ppm by gravimetric analysis. In the case of low pressure boilers, however, particularly where boiler tubes are large, sludge due to residual hardness in the treated feed water is permissible and the added cost for obtaining low residual hardness cannot be justified in most cases.

The controversy of alkalinity versus carry-over and embrittlement is one for the ivy-clad institutions and the specialists. It seems generally conceded that in equal concentrations alkalinity has a greater tendency to induce carry-over than do other solids which is sufficient information to warn to proceed with caution with alkaline boiler waters. On the effect of alkalinity on liberation of carbon dioxide with steam, however, there can be no dispute. At least 80 per cent of the sodium carbonate alkalinity in a feed water is converted to caustic soda in the boiler with a corresponding liberation of carbon dioxide with the steam. Therefore, feedwater alkalinity control is desirable. To eliminate carry-over, boiler water alkalinity can be reduced by blow-down—an expensive method. However, the carbon dioxide liberated with the steam is almost purely a function of fed water alkalinity and is not affected appreciably by blow-down. This emphasizes the desirability of controlling feed water alkalinity, the degree of reduction being balanced between its cost and the cost of maintenance of traps and condensate lines subject to corrosion by the carbon dioxide re-dissolved in the condensate.

TABLE 1—Total Allowable Solids vs. Boiler Pressure

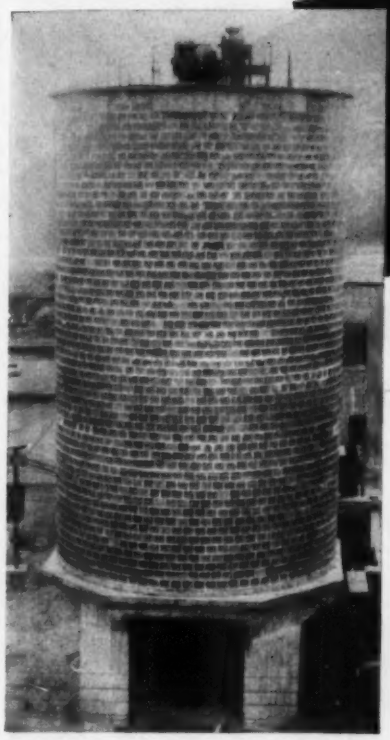
Boiler Pressure (psig)	Total Solids (ppm)
0- 300	3500
301- 450	3000
451- 600	2500
601- 750	2000
751- 900	1500
901-1000	1250
1001-1500	1000

Reduction of total solids is important if only for the fact that total solids is the classical basis for determination of blow-down schedule. The election of the maximum total solids concentration which can be maintained without carry-over must be tempered by consideration of the character of the solids. However, the American Boiler Manufacturers Association has set up standards which are generally acceptable and conservative; these are given in Table 1.

Silica is objectionable in boiler waters for its tendency at high concentrations to form hard scale on heating surfaces and to be carried with steam into turbine blading where it deposits. Both phenomena are more noticeable at high operating pressures, and for that reason the maximum concentration allowable is a function of boiler pressure as is the case for total solids. Table 2, based upon the experience of operators of plants with which the Cochrane Corporation has been concerned, is offered as a guide for control of silica concentration in boiler water, although this is admittedly arbitrary. In certain cases, where silica reduction in feed water is not practical, it will be found necessary to schedule blowdown on the basis of silica concentration rather than total solids.

TABLE 2—Silica Concentration vs. Boiler Pressure

Boiler Pressure (psig)	Silica (ppm)
150	150
250	100
400	75
600	50
900	25
1200-2000	5



CHIP STORAGE TANKS

Another use for

KALAMAZOO Glazed Tile

Kalamazoo felt quite fortunate in being able to participate in the erection of the new Hudson Pulp & Paper Mill of Palatka, Florida. This 46x27-ft. tank was built entirely of Kalamazoo blocks providing storage for chips which are conveyed direct from the chipper by a Redler type conveyor.

Kalamazoo erects many storage tanks for clay, ashes, fuel and other bulk materials in addition to numerous other types of tanks and chests for handling paper mill stock. This type of construction is NO higher in cost.

KALAMAZOO TANK & SILO COMPANY

KALAMAZOO - - - - - - - - - - - - MICHIGAN

TABLE 3—Comparative Chemical Costs for Reduction of Hardness

Chemical	Process	Formula	Cost, $/ton	Units per Unit $CaCO_3$ Hardness	Cost, cents per gr./gal. 1000-gal.	Comparative Cost
Lime (90%)	Precip.	$Ca(OH)_2$	12	0.82–1.64	0.07–0.14	1.00–2.00
Dolamite lime (65%)	Precip.	$Ca(OH)_2 \cdot MgO$	13	1.14–2.28	0.11–0.21	1.52–3.04
Soda ash	Precip.	Na_2CO_3	24	1.06	0.182	2.60
Salt	Ion Ex.	NaCl	12	3.15	0.27	3.85
Sulphuric acid	Ion Ex.	H_2SO_4	24	1.75	0.30	4.30
Caustic soda	Precip.	NaOH	54	0.80	0.31	4.40
Phosphoric acid (75%)	Precip.	H_3PO_4	110	0.88	0.69	9.80
Disodium phosphate	Precip.	$Na_2HPO_4 \cdot 12H_2O$	60	2.39	1.02	14.6
Trisodium phosphate	Precip.	$Na_3PO_4 \cdot 12H_2O$	60	2.53	1.08	15.6
Disodium phosphate	Precip.	Na_2HPO_4	150	1.11	1.19	16.9
Monosodium phosphate	Precip.	$NaH_2PO_4 \cdot H_2O$	180	0.92	1.19	16.9

In such cases, a review of the cost of silica reduction should be made to determine whether the investment for the process can be justified on the basis of savings in reduced blowdown.

The cost of hardness reduction is shown by Table 3. In this tabulation, the various reagents have been placed on an equivalent basis. Obviously, such a table cannot tell the complete story, since, for example, residual hardness will vary. Nevertheless, the reagents are in correct relative position.

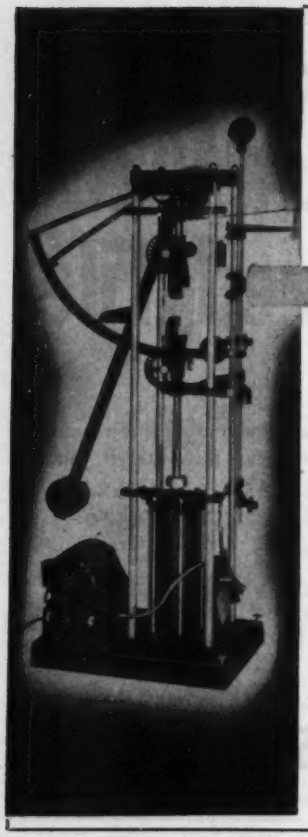
Table 4 applies to the cost of alkalinity reduction. Again it is necessary to qualify these figures. Lime will reduce the alkalinity of most waters, but can have no effect on sodium alkalinity. The only method of reducing sodium alkalinity with corresponding reduction in total solids is by the ion exchange process operated on the acid cycle, since with the precipitation process or by direct addition, a byproduct is formed.

The cost comparison applying to reduction of total solids is given in Table 5. The reduction of total solids by these various reagents should be considered from the standpoint of the calcium and magnesium carbonates in the raw water since only the ion exchange process operated on the acid cycle can effect reduction of sodium alkalinity. However, in consideration of the other salts present, the table represents a good estimate of the cost of total solids reduction.

Chemical requirements for reduction of silica are difficult to estimate: in the precipitation process, silica is removed by absorption so that the chemical dosage is a function of the inlet silica concentration and the desired residual, and the dosage is also affected by the particular—and organic constituents in the water; in the presence of both inorganic salts—magnesium salts in ion exchange process, which has previously been shown to be rather inefficient, a review of the literature indicates that the sodium

TABLE 4—Chemical Cost for Alkalinity Reduction

Chemical	Process	Formula	Cost, $/ton	Units per Unit $CaCO_3$ Alkalinity	Cost, cents per gr./gal. 1000-gal.	Comparative Cost
Lime (90%)	Precip.	$Ca(OH)_2$	12	0.82–1.64	0.07–0.14	1.00–2.00
Dolamite lime (65%)	Precip.	$Ca(OH)_2 \cdot MgO$	13	1.14–2.28	0.11–0.21	1.52–3.04
Sulphuric acid	Direct ad.	H_2SO_4	24	0.98	0.168	2.40
Gypsum	Precip.	$CaSO_4 \cdot 2H_2O$	22	1.72	0.27	3.87
Sulphuric acid	Ion Ex.	H_2SO_4	24	1.75	0.30	4.30
Epsom salts	Precip.	$MgSO_4 \cdot 7H_2O$	36	1.20	0.39	5.60
Phosphoric acid	Precip.	H_3PO_4	110	0.88	0.69	9.80



THWING-ALBERT
ELECTRO-HYDRAULIC
TENSILE
STRENGTH
TESTER

for

TENSILE, SHEAR
AND
COMPRESSION TESTS

SMOOTH AND
STEPLESS LOADING

Built to Conform to
A.S.T.M. and T.A.P.P.I.
Specifications

THWING-ALBERT
INSTRUMENT COMPANY
5353 Pulaski Avenue
Philadelphia 44, U.S.A.

32

ASTEN
DRYER
FELTS

ASTEN-HILL MFG. CO., PHILADELPHIA
ASTEN-HILL LTD., VALLEYFIELD, QUE.

TABLE 5—Chemical Cost for Total Solids Reduction

Chemical	Process	Formula	Cost, $/ton	Units per Unit $CaCO_3$ Total Sol.	Cost, cents per gr./gal. 1000-gal.	Comparative Cost
Lime (90%)	Precip.	$Ca(OH)_2$	12	0.82–1.64	0.07–0.14	1.00–2.00
Dolamite lime	Precip.	$Ca(OH)_2 \cdot MgO$	13	1.14–2.28	0.11–0.21	1.52–3.04
Sulphuric acid	Ion Ex.	H_2SO_4	24	1.75	0.30	4.30
Soda ash	Ion Ex.	Na_2CO_3	24	2.10	0.36	5.14*
Phosphoric acid	Precip.	H_3PO_4	110	0.88	0.69	9.80

* Note: Reduction of solids by demineralization will be a summation of 3 and 4 and will amount to 0.30c to 0.66c per gr./gal. per 1000 gal. as the ratio of alkalinity to total anions varies from 1.0 to 0.0 respectively.

fluoride dosage must be approximately 175 per cent of theoretical.

Table 6 indicates the approximate chemical dosage for silica removal. An attempt has been made to anticipate the requirements of each reagent based upon reasonable silica reduction; the data have been taken principally from laboratory and field reports and a general review of the literature.

In considering these costs, it must be recognized that they are to be compensated for the blowdowns schedule to be maintained, the blowdown schedule influencing the quantity of water required and also adding the expense of heat loss, which amounts to approximately 5-million pounds for every 1 per cent blowdown if continuous blowdown equipment with a 20 deg. terminal difference is installed.

No attempt is made to present equipment costs which are necessarily variable. For example, with precipitation processes, equipment cost is principally a function of load; with ion exchange equipment, it is a function both of load and concentration of salts in the incoming water. The picture is further complicated by the requirement for other auxiliary equipment, particularly deaerating apparatus.

There are three other factors governing the selection of equipment which can be covered only by generalities. One of these is the presence of certain constituents in the water, such as color and turbidity. The presence of color in a water favors the selection of clarifying equipment and ion exchange apparatus, this for the reason that color leached from vegetation prevents precipitation of hardness in a sedimentation tank. The presence of turbidity, on the other hand, favors the selection of a precipitation type apparatus, since the removal of turbidity and hardness may be accomplished in a single apparatus, ion exchange softeners requiring that a turbid water be pretreated.

TABLE 6—Chemical Cost of Silica Reduction

Chemical	Process	Formula	Cost, $/ton	Units per Unit SiO_2	Cost, cents per gr./gal. 1000-gal.	Comparative Cost
Dolamite lime (35% MgO)	Precip. (Hot)(b)	$Ca(OH)_2 \cdot MgO$	13	9.6	0.89	1.00
Remosil	Precip. (Hot)(b)	MgO	160	3.36	3.84	4.32
Epsom salts	Precip. (Hot)(b)	$MgSO_4 \cdot 7H_2O$	36	13.7	3.9–4.9(e)	4.4–5.5
Ferrisul	Precip. (Cold)(b)	$Fe_2(SO_4)_3$	50	29.6	11.4–13.4(e)	12.8–15.1
Fluorides	Ion Ex.(c)	NaF	200	7.5	16.6(d)	18.60

Note: (a) Based on initial silica of approx. 20 p.p.m.
(b) Precipitation process based on reduction to 1 p.p.m. SiO_2 in hot process, 3 p.p.m. in cold process.
(c) Ion exchange process based on reduction to 0.5 p.p.m. SiO_2.
(d) Cost includes additional acid and alkali required for regeneration by the fluoride addition.
(e) Cost includes alkali for precipitation.

A second favor depends upon the individuality of the plant itself. One obvious item in this category is the limitation of space. Another, usually favoring ion exchange equipment, is the requirement for large volumes of treated water for process of cooling, forcing the power engineer to accept treated process water and to doctor it for his boilers. Still another item in this category, usually favoring a sedimentation process, is variation in the characteristics of the supply, brought about by seasonal variations in surface water or withdrawn from a number of wells on plant property.

The third favor, usually favoring the salesman with the most convincing story, is the cost of labor for operation and maintenance.

Training in the Vocational Schools

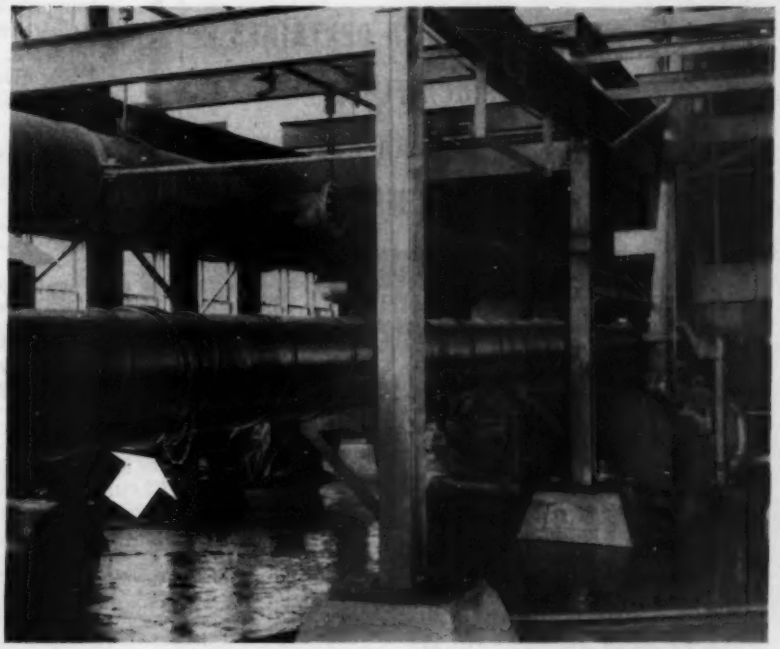
GEORGE A. McGARVEY
U. S. Office of Education

It may seem that one is reminiscing by referring to the progress made by vocational education under the National Vocational Education Act since its passage in 1917. However, to gain a true perspective, it is necessary to point out the growth and changes which have happened in the field of industrial education since that time. This was the first grant of aid for vocational education to the states on a matching basis and resulted in all the states accepting the provisions of the National Act, organizing classes for the training and upgrading of workers, and co-operating with management and labor in carrying on this program. The early start of this program was at the time of the entry into the First World War and during the first two years the efforts of the states were devoted to the preparation of youth to serve better in the armed forces and to train and upgrade workers in wartime industries. Not until 1919 and 1920 were all the states organized so as to promote the program of industrial education on a peacetime basis.

To show the growth of training, the gradual increase in enrollments during this early period is pointed out. In 1918 there were approximately 118,000 enrolled in all the programs of industrial education in all of the states. The increase during the next two decades, or until 1929-30, was approximately 633,000.

Depression and economic changes have had their effects on the progress of industrial education. During the period of one depression, or from 1930-35, there was a decrease over the previous 5-year period in the numbers attending vocational classes of approximately 15 per cent. From 1935, for the next 5-year period, there was a steady increase until the states reported enrollments of 850,000. Therefore, in a period ending in 1944, approximately a quarter century after the establishment of vocational education in 1918, there has been a steady growth in the preparation and upgrading of workers under public supervision and control. During the recent World War there was another decrease because most of the youth of employable age were at work in war production industries. During the past few years the enrollments have again increased and for 1947 the total was 728,000.

So far the discussion has concerned enrollments of workers in schools and there is probably question as to the connection this information has to do with the training in the pulp and paper industry. It has a very direct association with the industry because in the years 1920 and 1921, the period in which pioneering work was being done in vocational education, foreman training conferences were conducted with manufacturing members of the Technical Association located in different parts of the country. In reviewing the reports of these conferences, in 1921 a foreman training conference was conducted at the Champion Paper and Fibre Company, Canton, North Carolina. Other meetings were held in Portland, Oregon, and Everett, Washington, with representatives from several plants in these two states. Also, in 1922, conferences were conducted with the Hammermill Paper Company in Erie, Pennsylvania, and with the Pejepscot Paper Company in Brunswick, Maine. This is significant since a new technique which had been developed during the First World War, particularly in the shipbuilding industry, was being tried out in several of the basic industries such as transportation, mining, and manufacturing. Therefore, foreman training of the so-called conference type had its beginning in these early programs conducted in the pulp and



It's **NAYLOR** *Light-weight* **PIPE**
with **NAYLOR** *Wedge-Lock Couplings*

Along with the extra strength and safety provided by Naylor light-weight pipe, the new Naylor Wedge-Lock Coupling offers speed, flexibility and economy in pipe connections never before possible in paper mill piping. A hammer is the only tool required to install this advanced-type coupling. A joint can be made up with only one side of the line in the open. Furthermore, when uniform lengths of Naylor pipe are used, replacement of joints can be made without disturbing the balance of the line.

Naylor

NAYLOR PIPE COMPANY
1255 East 92nd Street, Chicago 19, Illinois
New York Office
500 Madison Avenue, New York 17, N.Y.

Uniformity

a BIG reason why

more and more Paper Mills are insisting upon these proved products

IDAHO

POTATO STARCH

* Magic Valley Processing Co., OF IDAHO
* St. Anthony Starch Co., Inc., OF IDAHO
* Menan Starch Company, Inc. OF IDAHO

POTATO & TAPIOCA DEXTRINES

TAPIOCA FLOUR

LOCUST BEAN GUM

CASEIN...ANIMAL GLUE

Southern Representative
WM L. GRIFFIN
P. O. Box 1570
Charlotte, N. C.

Western Representative
FRED BLOCK
A. Wilbur S. Co., Inc.
1 Drumm Street
San Francisco 11

★ SOLE DISTRIBUTOR

AMERICAN KEY PRODUCTS, INC.

"America's Largest Distributor of Potato Starch"

15 PARK ROW · NEW YORK 7, N. Y.

For an Unvarying Coating Mix

Use A

BROOKFIELD VISCOMETER

Now you can match laboratory specifications exactly, at point-of-process, with this portable instrument. Same instrument used for both readings. Extremely accurate. No special skills needed to operate. Only 30 seconds to make reading which is given directly in centipoises. Eliminate trouble from batch variations by ensuring that each mix is exactly the same viscosity. A Brookfield Sychro-Lectric Viscometer will make it certain and simple.

Send for 8-page illustrated booklet on the Brookfield Viscometer — and its applications.

BROOKFIELD ENGINEERING LABORATORIES, INC.

250 Porter Street, Stoughton, Mass.

paper industry, and by other basic industries.

Briefly stated, the characteristics of this type of foreman training, which is used extensively by industry at the present time, was a group discussion meeting for the supervisory staff in any plant. No particular information was imparted by the conference leaders but the discussion centered around problems of supervision and training common to that industry and the solution was arrived at usually by drawing on the information of the group members. There was no attempt on the part of the leader in charge of the group to inject his ideas into the discussion. In fact, the leader in many instances was not acquainted with the industry in which the conference was being conducted. The leader did, however, possess the technique of how to conduct a conference to lead the group to a final decision. In the discussion the responsibility of the foreman or supervisor in training or upgrading the workers was brought out and the steps to be taken in how to instruct and upgrade workers was carefully analyzed and demonstrated by the group members.

It is interesting to note at this point that during the Second World War considerable attention was given by the Training-Within-Industry group to what was termed Job Instructor Training. That was a condensed course of from 10 to 12 hours in length which included many of the ideas which were worked out in these early conferences which have just been referred to and carried on in the Pulp and Paper and other basic industries.

In 1933 there appeared a publication of the U. S. Office of Education, then the Federal Board for Vocational Education, entitled *Vocational Training in the Pulp and Paper Industry.* This was a joint undertaking of the Technical Association, members of several State Departments of Education, and representatives from the Federal Office of Education. In examining this publication of fifteen years ago, it is interesting to note what some of the objectives were at that time. In the foreword of this publication, there appears a statement by the president of the Technical Association in which he says in part, "In previous years (previous to 1932) the pulp and paper industry has taken progressive steps in two directions, giving practical mill training to college men who are about to enter its ranks, and giving the operating man an opportunity to know more about his job. But obviously, a man can not be trained properly unless we know all about his duties and what he needs to know. Then we can plan courses which will fit his requirements and make him more valuable to his company."

This study and its publication in 1933, the author I am sure has stimulated training in the industry and in the public vocational schools. Since this time, however, undoubtedly the industry has changed and with this change a somewhat different type of training is needed.

World War II has shown many weaknesses. One of these weaknesses is the lack of general education of many of our citizens. We also learned from the experience of supplying war demands, new methods of training operators.

For the present and the future, the author would say that we should continue the best work of the past in industrial education and add to this new types of training which would improve the worker as a citizen.

The later entrance of youth into jobs and the technical change in industry are two important factors which have a direct bearing on industrial training and education today. More youths are completing their formal education, that is, completing a high school training before entering industry. This means that industry is faced not only with the problem of meeting the training needs of an older group, but also with the problem of competition with other industries to secure its share of future workers in the industry. Since youth is more conscious of the part it is to play in industry through its guidance courses in the public schools, it behooves the industry to be ready to meet these demands through well organized training programs. Apprentices and future skilled workers in finding future occupations are asking such questions as:

1) What is the future of my place in this industry?

2) What opportunities are there for training and education in this industry?

3) What is the standing of this industry in the community or among other dominant industries in the community, region or state? And, of course,

4) What does the job pay?

Changes in production and equipment have also brought about the necessity of up-

grading the present working force. New Federal and state labor legislation has brought about changes in the industries methods of supervision.

The relation of the basic industries to the public is receiving greater attention. The author would suggest the need of informing the public of the scope, functions and importance of the industry. Magazine articles and trade journals are doing a splendid job in informing the public. It is believed, however, that more attention should be given in the public schools to the basic processes of the industry. These could be injected in the regular courses in the secondary school through text material and visual aids. The second suggestion is that this industry, like many other industries, have improved their methods of production, added new equipment, and the like, a knowledge of which should be incorporated in any training program. Therefore, it is suggested that more attention be given to imparting information of a technical nature to the operating group of your industry. And, lastly, this final suggestion—if plants in their respective communities would cooperate with the schools, splendid results would happen.

This vocational section of the Technical Association could render valuable assistance if it would attempt a study of one or both of these suggestions.

Abridgments in this section are from papers presented at the annual meeting of the American Pulp and Paper Mill Superintendents Association held in New Orleans, Louisiana, May 19-21, 1948.

Petroleum Base Pitch Control Additive for Sulphite Pulping

W. A. BEMAN and H. E. CORBIN*

Increased demand for paper in recent years has led to high tonnage requirements for sulphite pulp; additives for the digestion process, inert fillers, various organic compounds including wetting agents. It has been used with considerable success on a mill basis in sulphite pulping, particularly in the Mitscherlich process.

Decreased cook time or alternately a decrease in cook temperature, improved screening, more uniform pulp of increased brightness, change in nature of the resinous materials in the wood, improved performance of the pulp.

The use of an emulsified petroleum base additive in sulphite pulping has been shown to give better acid penetration resulting in decreased cook time or temperature.

Attempts have been made to use digester additives in sulphite pulping to produce increased rate of acid penetration insofar as this is related to cooking conditions, screening efficiency and fiber characteristics. In the initial mill trials, with the additive herein described, a particular objective was pursued, namely, control of the pitchy constituents of the pulpwood by modification, dispersion or solution to give improved papermaking qualities. It was found that the agent accomplishing this also increased acid penetration by apparently acting as a wetting-out agent for the resinous materials in the cellulosic structure. As the trial progressed at the particular mill from which these data were obtained, it was found that the effects of increased acid penetration were of greater importance, although the original purpose had been attained.

TABLE 1—Characteristics of the Emulsified Processing Additive

Type	Acid stable emulsion
Appearance	White viscous liquid
Per cent moisture	30.0% average
Weight per gallon-pounds	7.9
pH	3.5 to 4.5
Base stock	Aromatic oil
Dilution test	Satisfactory @ 70 deg. Fahr.
Resistance to hard water	+ 1,000 ppm
Resistance to alum	Good
Resistance to alkali	Poor
Freeze test	Negative

The trial was arranged at a Mitscherlich mill having eight horizontal indirect cook digesters each of ten tons capacity, charged by a gravity cold acid system. The pulpwood was northeastern spruce; the cooking acid was calcium base of approximately 5.5 per cent total SO_2.

Product Development and Evaluation

The industry has, for many years, used petroleum distillates, notably kerosene, as a means of combating pitchy conditions. Kerosene, however, has limited solubility characteristics and from the standpoint of a suitable petroleum product that might be used to dissolve the natural wood resins, it was felt that a base oil or solvent having higher solvent power for pitch should be chosen. This decision narrowed the choice to a series of special aromatic oils, the manufacture of which had been extensively developed as a result of wartime refining techniques. The choice of material was further predicated on the fact that one member of this series had proved to have considerable merit for pitch removal from wires and cylinders of paper machines that had to be cleaned as a result of excessive pitch in the stock.

To facilitate addition of the material to the system, it was decided to convert it to the aqueous phase which was accomplished by adding a controlled amount of emulsifier and water and so adjusting the formulation that the resultant product was stable to

(*) The authors are with the Socony-Vacuum Oil Co. Mr. Beman is located at Albany, N. Y.; Mr. Corbin, at Brooklyn.

This OASIS Electric Water Cooler defies lint, dust, heat, acid fumes, or high humidity!

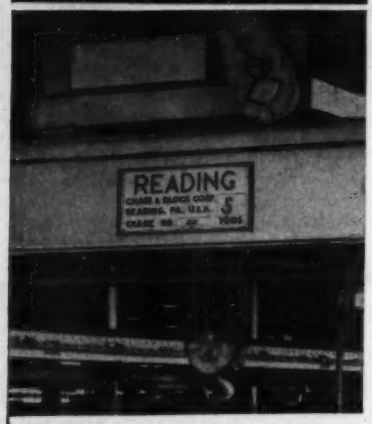
Provides efficient thirst-relief where other coolers fail

Employees in your industry have extra need for *properly cooled* drinking water. Plenty of fresh, *cool* water helps them do better work more easily because it makes them feel better. OASIS Model OP-10-W is built for the special needs of mills and foundries to give years of trouble-free service. Its stainless steel top and rustproofed, multiple-coated cabinet are heavily insulated. Equipped with a water-cooled condenser, the OP-10-W delivers full capacity in high temperature locations. Available with EBCO's famous, smooth-working dial-action bubbler for spurtless drinking ease. Write for complete information. Mail the coupon today!

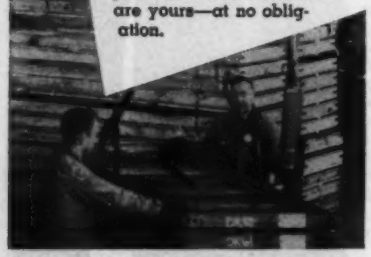
OASIS ELECTRIC WATER COOLER

The EBCO Manufacturing Co.
401 W. Town St., Columbus 8, Ohio
Please rush details on OASIS Model OP-10-W
NAME _____ TITLE _____
FIRM _____
STREET _____
CITY _____ ZONE _____ STATE _____

FAST MATERIALS HANDLING
For YOUR New Building!



• New buildings, like new machines, are *designed* to increase output and reduce unit costs. That's why it pays to consult a Reading Engineer *before* you install handling equipment in a new shop or plant. For example, in this new annex, crates of sheet steel moved too leisurely from flat cars, to stock pile, to motor truck . . . until a Reading Engineer was consulted. After careful analysis, 2 *specially-designed* 5-ton Reading Cranes, equipped with electric push buttons were recommended and installed. Now crates "step lively", handling time is reduced . . . *and fewer men move more materials, more easily!* Start your new building "off on the right foot", now. For faster, more economical materials handling, call in a Reading Engineer. His experienced recommendations are yours—at no obligation.



READING CHAIN & BLOCK CORPORATION
2113 ADAMS ST., READING, PA.
Chain Hoists • Electric Hoists
Overhead Traveling Cranes

READING HOISTS

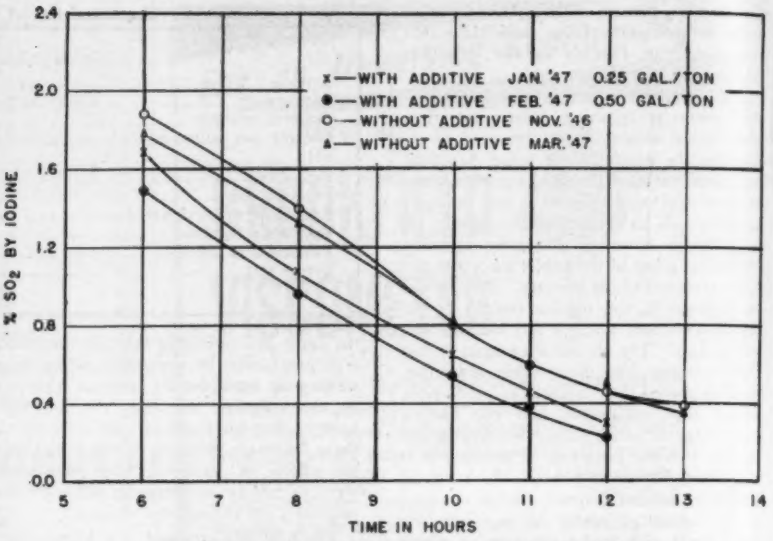


FIGURE 1—SO_2 REDUCTION DURING DIGESTION

reasonable conditions of transportation and storage. It might be added that the emulsifier used enables the concentrated product to be very highly diluted with water or Mitscherlich cook liquor without destroying the emulsion and, in addition, possesses the property of being substantive to cellulosic materials. Table 1 gives pertinent typical characteristics of the addition agent.

The preliminary plant test was made on the basis of adding one per cent of the material to the chips; assuming that the chips contained one per cent pitch, the amount was equal to the pitch present. While one per cent was probably not the exact amount of pitch, it represents a fair approximation of the average pitch content based on ether extractions.

Although it was realized that the treatment at the high concentration level was not economical, the principal observation from the initial test was that the treated pulp gave superior performance on a fourdrinier paper machine operated in conjunction with the pulp mill. It was felt, however, that the preliminary work was justified on the basis of obtaining a positive indication of the effect of the treatment.

In initiating a continuous test, it was realized that two factors would have to be considered: (a) the solvent treatment would exert a dissolving action on the old pitch deposits in the lines and equipment at some certain critical concentration which had to be established; (b) volatility of some components of the additive might be introduced in the acid make-up with the sulphur dioxide relief gases.

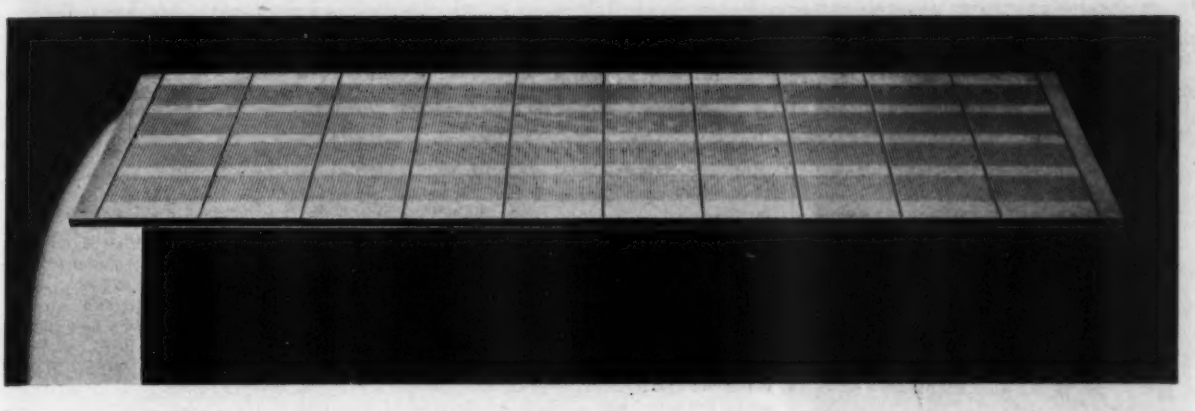
The test was begun by adding 2.5 gallons/ton of chips to alternate digesters and continued on this basis for approximately 60 hours at which time the dosage was increased to 2.5 gallons/ton of chips for each digester. The product was added directly to the chips while the digester was being charged, although a more uniform and practical method of application for continuous operation would be to meter the emulsion directly into the acid line feeding the digester. However, after running an additional 30 hours at this concentration, extremely large pitch balls suddenly appeared in the slush pulp system.

From the dark appearance of the agglomerated material, it was felt that this was previously deposited pitchy material. Close inspection of the screens, the thickeners, and the Kaymr cylinder and press section indicated that old deposits of a heavy nature were being gradually removed. A brass plate on the brown stock decker which initially was heavily coated with resinous material eventually became entirely bright and shiny, as operations were continued. It was felt that this was an indication of the solvent action of the material on pitch deposits, and there was general agreement that the source of the trouble was the loosening of the old deposits. However, to prevent additional operating difficulties, it was decided to dis-

TABLE 2—Characteristics of Extracted Pitch

	Extracted Pitch From	
	Untreated Pulp	Treated Pulp
Viscosity @ 210 deg. Fahr., S.U.S.	733	558
Ring & Ball Softening Pt., deg. Fahr.	100.5	98
Needle Penetration @ 32 deg. Fahr., 100 gms., 5 secs.	37	41
Tackiness*	83	64

(*) Tackiness is determined by measuring the force required to pull a spherical ball from an embedded position in the surface of the sample in question. A higher reading indicates a material of greater tack.



The "Hardy" Chrome-Nickel-Steel SCREEN PLATE

OVER 20,000 IN SERVICE

No slot wear in twelve years! The important sharp top edge and burnished cut remains unaffected by erosion and corrosion. AND DO THEY SCREEN!

MAGNUS METAL CORPORATION FITCHBURG, MASS.

continue the treatment until the system had cleared itself.

In spite of the excessive amount of this old pitch, no difficulty was caused in the operation of the Kaymr machine. The press rolls lost their coating of pitchy materials and brightened with continued operation in the same manner as the decker.

Following a scheduled cleanup, two weeks later, dosage was resumed at the rate of 0.25 gallons/ton of chips and continued on this basis for eight weeks. The treatment was discontinued for observation of results for a four week period. Treatment was started again for one week at a rate of 0.50 gallons/ton of chips and then discontinued for a further period of nine weeks. Following this, operation has been continuous at the rate of 0.25 gallons/ton of chips.

A considerable amount of work has been expended on running extractions on the finished pulp samples collected during the run, but in general, the results do not indicate a definite change in percentage of extractable materials. It should be realized that the usual standards of measuring pitch as a direct function of extractable material cannot be used in analyzing these data. A certain amount of residual oil from the additive is known to be in the treated pulp and will obviously be extracted by conventional solvents such as ether, alcohol or ethyl acetate.

However, it should be emphasized that pitch content is normally determined by extraction, only to give an indication of the performance of the pulp in papermaking. It is a recognized fact, for example, that highly oxidized pitches, although extractable, are not troublesome in papermaking. Regardless of the extractable matter in a given pulp, the final criterion is always the performance of the pulp on the paper machine; and any treatment that modifies the tackiness characteristics of unoxidized resins, or disperses the troublesome pitch, is in effect equivalent to removing the pitch. Based on observations made during and after the test, it is felt that the additive plasticizes pitch, renders it less tacky as a result of its solvent action, and thereby causes the pitch in the treated pulp to be trouble-free with respect to papermaking operations. Physical characteristics of extracted pitch from treated and untreated samples of pulp which support this contention are given in Table No. 2.

Pertinent data relative to increased rate of acid penetration are indicated by the cook time—SO_2 relationship shown graphically in Figure 1. It might be stated that the data used have been taken from the mill records and represent average values in an attempt to minimize fluctuations encountered as a result of such local operating variables as changes in the acid strength and differences in pulpwood.

Progress of the cook is, of course, determined by measurement of the free SO_2 and it will be noted that, in general, the slope of the curves (each line is an average of eight cooks, i.e., one complete digester cycle) indicates a faster cook when the processing aid is employed. This observation has been borne out over the entire test time. No adverse effects on yield were reported from the shortened time cycle. Increased production, however, was appreciable, being in the order of 5 to 10 per cent.

It might also be pointed out that the same general effect is evident for a short period after discontinuing the use of the treatment. This is an indication of residual effect, due to build-up in the acid system and as might be expected, by analogy, a short period of time is necessary after the processing aid is added before any effects are noted. The time involved for noticeable effects to be manifest depends not only on build-up in the system, but on the condition of the system itself. Thus, a system in which storage facilities, pipe lines, and equipment contain appreciable deposits of pitch-dirt-slime masses or are coated in a perceptible degree will require longer periods of treatment than cleaner systems.

Mill operating data for the past several years indicate that it has been necessary to spend eight to twelve hours every two to three weeks for cleaning the system. Screen capacity being a limiting factor, this has resulted in a production loss of three to five tons of pulp per hour of shutdown time or an average loss of fifty tons per shutdown. It has been shown that by using the additive continuously, the period between shutdowns can be greatly lengthened. During the test period, the interval between shutdowns was extended to an average of ten weeks and increased production as a result of this effect alone amply justified use of the treatment. A credit may also be allowed for labor savings as a result of decreased downtime.

In the Field of Irrigation

It is in the field of Irrigation that Layne Well Water Systems and Layne Vertical Turbine Pumps are most appreciated for their outstanding superiority of design, construction and quality. Of all places, the Irrigation field must have the utmost in dependability for long periods of continuous pumping. It is in this field that Layne water producing equipment is easily a 10 to 1 favorite in every case where ground water is used. Such leadership is highly complimentary to excellence of performance.

Basically, Layne Well Water Systems are extremely practical in design, and this design is noted for high efficiency. And supporting practical design and high efficiency, there is that well known Layne quality that assures longer life and practically no upkeep expense.

Layne Well Water Systems are designed for use in all situations where huge quantities of water must be produced at the lowest possible cost; packing houses, municipalities, factories, chemical processing plants, milk plants, petroleum refineries, railroads, etc.

For further interesting facts, literature, bulletins, etc., address

LAYNE & BOWLER, INC.
General Offices
MEMPHIS 8, TENN.

LAYNE
WELL WATER Systems

AFFILIATED COMPANIES: Layne-Arkansas Co., Stuttgart, Ark. * Layne-Atlantic Co., Norfolk, Va. * Layne-Central Co., Memphis, Tenn. * Layne-Northern Co., Mishawaka, Ind. * Layne-Louisiana Co., Lake Charles, La. * Louisiana Well Co., Monroe, La. * Layne-New York Co., New York City * Layne-Northwest Co., Milwaukee, Wis. * Layne-Ohio Co., Columbus, Ohio * Layne-Pacific, Inc., Seattle, Wash. * Layne-Texas Co., Houston, Texas * Layne-Western Co., Kansas City, Mo. * Layne-Western Co. of Minn., Minneapolis, Minn. * International Water Supply Ltd., London, Ont., Can. * Layne-Hispano Americana, S. A., Mexico, D. F.

As a result of better screening conditions, it is to be expected that the amount of tailings would be somewhat less, since clean screens obviously pass more fiber than those which are partially filled with pitchy and/or slime deposits. The knot rejects from the treated pulp were slightly softer and contained less entrapped fiber as a result of the effect of the emulsion in the digestion process.

At the mill conducting the test, it had been the practice to use a proprietary compound of the chlorinated phenol type in the pulp system for bacteria and slime control. It was found that after continued use of the agent, this could be eliminated without harmful results in the winter months and cut down considerably, even in late spring when the water had warmed up. It is believed that slime is greatly reduced by elimination of tacky materials such as pitchy constituents which act as binders. It has been suggested that the hydrocarbon constituent of the assist may have a bactericidal action due to its highly aromatic nature, but this has not been established.

Pitch troubles materially decreased when treated pulp was used for the furnish of the paper machines operated by the test mill. For example, after running treated pulp, it was found during the usual weekly inspection of the fourdrinier section that very little pitch had been deposited on the leading edges of the suction box covers, inside wire rolls and doctors. The papermakers attributed the improvement to a better grade of pulp, inasmuch as they were unaware of the test being conducted at the pulp mill. It is particularly significant to add that they were able to tell each time the test was discontinued and resumed.

Action of Digester Assist

From the observations made, a theory is advanced herewith on the manner in which the addition agent functions in the pulping operation. The solvent oil in its emulsified state is capable of mixing intimately with the cook liquor, insuring good dispersion. Based on observations of cook liquor samples, the emulsion breaks as the cook continues, giving a dispersed oil phase in which the chips are located. This type of system is generally recognized to be the most efficient for extracting an oil-soluble material (in this case, the pitch) from the aqueous phase. The end-products of the cook contain considerable amounts of ligno-sulphonic materials which are capable of functioning as emulsifiers, and a one-phase system again results as the cook is completed. Depending upon washing efficiency, this makes it possible to remove a percentage of the pitch-oil solution with the wash water. When the assist was used, the blow-down liquors were noticeably darker in color and of slightly higher specific gravity, indicating a greater percentage of pitchy-lignin complexes had been removed.

Conclusions

The results of the extensive plant scale test of the processing aid made over a period of aprpoximately one year in Mitscherlich wood pulping operations indicate several advantages which may be derived from the use of the product. These include a shorter cook, control of pitch, improved screening and more uniform fiber characteristics, all of which are reflected in improved economy of operation of both the pulp and paper mill.

Certain additional factors have been reported in this particular mill and are of interest, although of lesser direct value. These include:

a) Increase in initial brightness of pulp
b) Lowered bleach requirements
c) Less foaming in the pulp mill system

It might be pointed out that certain initial work, including a combination of the processing agent with an inert filler, laboratory determinations of extractable matter, etc., are not covered in this report. Subsequent work indicated that these data were irrelevant.

The conclusions in this report are based entirely on acid pulping by the Mitscherlich process which is essentially a slow cook using indirect steam. Since the results of the plant test were so favorable, and since the majority of the mills in this country are of the quick cook-type using direct steam, investigation of the action of the processing aid in this type of installation has recently been carried on. Plant tests in several mills in widely varying geographical locations but all employing some variation of the Chemipulp process have yielded discordant results. In all cases, the tests did not produce successful results as might be expected. If all mills operated under the same conditions, acid pulping would probably not be a subject on this program. Because of the variation of wood supply and condition, diversity of procedure of acid plants and pulp mills and use requirements of the finished pulp, the application of the additive must be fitted to the peculiar operation of each mill. In addition, the reason given for using such an aid has been as complex in nearly all cases. For instance, aside from pitch control per se, it has been applied to reduce cook time, cook temperature, compensate for weak acid, increase production, produce brighter pulp, decrease slime and reduce dirt.

Some New Thoughts Regarding the Cylinder Machine

J. V. EDGE
Downingtown Manufacturing Co.

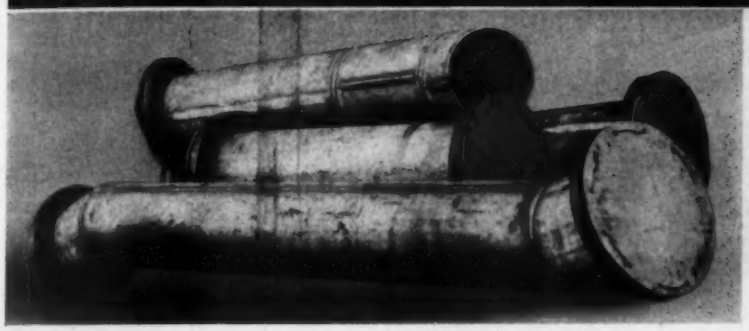
I feel very well qualified to speak on the modern board machine, not because I am an authority, but because recently our company has built a number of the most modern cylinder machines in the country.

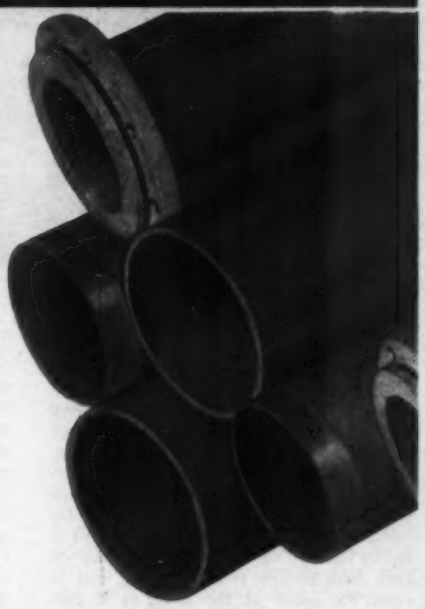
In board machines the emphasis is not on width of machines as with the fourdrinier, nor do mills generally expect to get much over 500 fpm. So they may be classified as the less critical type of machine mechanically. They are, however, none the less complicated and involved.

As far as information goes, just as much care must be used in each of the vats as in the single fourdrinier head box. Operators are hampered in this since it is difficult to see a single ply so that you can often only guess at what's the matter.

The thicker a sheet of wet paper is, the harder it is to dry either by pressing or by heated dryers, necessitating even greater care in construction and arrangement of presses and greater care in selecting the correct dryer arrangement.

MISCO *Stainless Steel* PIPE and TUBES





Misco Stainless Steel Pipe and Tubes are made in rolled and fabricated sheet material or from centrifugal castings poured in induction melted metal. They are provided in a wide range of sizes with wall thicknesses of 16 gage and heavier, according to requirements of service and method of construction. Misco Stainless Steel Pipe and Tubes are available in any commercial stainless steel analysis and we are pleased to offer recommendations to meet specific conditions. We invite you to consult us freely on any matter involving the use of stainless steel castings, pipe and tubes.

Michigan Steel Casting Company
1992 Guoin Street . **DETROIT 7, MICHIGAN**

One of the World's Pioneer Producers and Distributors of Heat and Corrosion Resisting Alloys

MISCO CENTRIFUGALLY CAST TUBES

Recommended for Pump Liners • Sleeves • Valve Seats • Shafting • Retorts • Fittings • Bushings • Rings of all kinds • Burner Pipes • Chemical Piping and many other applications requiring cylindrical castings.

Although the fundamental principles in cylinder machines have changed little, there have been a great many refinements made, that are noteworthy.

I think it is much easier to talk about a picture and much easier to understand a speaker with a picture in front of you, so I have had a few slides made up which will show some views of our most modern board machines.

Vats and Suction Drum Roll and Nofome Mixboxes (Figure 1)

Here you see the section of uniflow vats on a seven-cylinder board machine used to make a lined chip board.

All seven of these vats are uniflow and all are made of stainless steel. In the background you will notice part of the approach flow system. These are the mixboxes and are also of stainless steel. The stock from the screens is fed up through the bottom, while recirculated white water is also forced up through the bottom. Here in the bottom of these mixboxes is where the final dilution occurs, and the final and complete mixing of stock and white water without stratification. The stock then flows over a weir which allows entrained air in the form of bubbles to escape. From here the stock passes to the approach flow inlet.

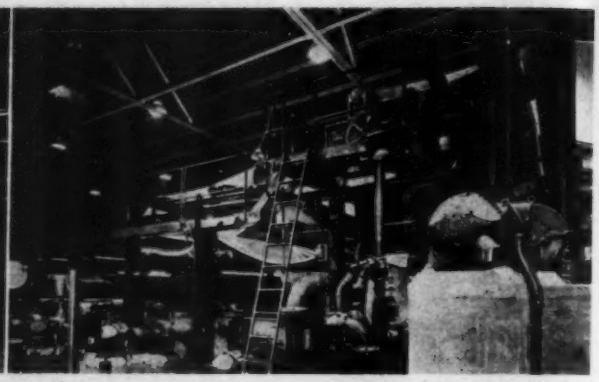
Please note the sectional electric drive for the suction drum roll. Also here on the front you see the suction connection for the drum roll. Note that the vacuum is applied through the frames on the front side of the machine which is a great improvement over pipe, thus eliminating the awkward suction connections used on earlier rolls.

Duplex Hoppers (Figure 2)

From the screens, the stock is fed through pipes of proper design to the bottom of these long stainless steel approach flow hoppers. In these hoppers is where good formation is born, as is necessary to produce a level and well formed sheet of board. The purpose of the hoppers is, of course, to spread the stock from the single round pipe to an even flat ribbon of stock the full width of the cylinder mold. To do this properly, the cross section area of the stock pipe should be maintained through the vat entrance equipment, so that the velocity of the stock will not be materially changed during this spreading action. The approach flow system must be free of turns, baffles or projections which will tend to change the rate of flow even momentarily. The same

1

2



idea of uniform rate of flow is carried through the vat partitions to the mold itself.

You can also see in the picture small portions of the overflow system. It has been found that as much as one-third of the stock entering a uniflow vat is overflowed and returned to the mixboxes. Here you see a portion of this overflow hopper and the pipe and recirculating pump. The reasons for overflowing stock are varied, but I think it can be summed up in these two reasons—to keep dead pockets from occurring, and to make the speed of the stock as it goes around the vat circle approach the speed of the cylinder mold face tending to give a uniform fiber formation.

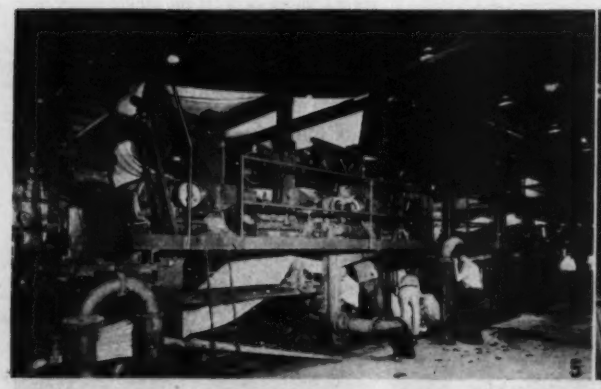
The next slide will show a closer picture of the vats themselves.

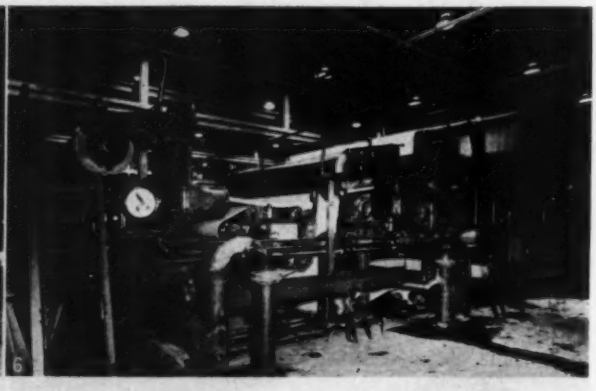
Front Side of Vat Section (Figure 3)

Here you see all seven vats and a good picture of the suction drum roll. Notice the clean neat stainless steel vats. Also notice how the cylinder mold, top roll, slice, etc., are carried on cast iron stands independent of the vat itself.

The use of stainless steel has sometimes been termed a "luxury item" on a paper machine. Perhaps during these unsettled times you might call it so, but I feel confident that in a very few years mills having stainless steel vats will feel they are more than a luxury for easy-to-clean equipment, and clean paper is becoming more important every day. To have a vat that is easily cleaned with a common hose makes real cleanliness an easy job. Also, the bacteria count of paper will be watched much more closely, especially in mills making bottle caps, butter cartons, etc.; even cereal box board may have to come under a certain bacteria count specification. The stainless steel vat is one way to help control this condition.

There has always been controversy on which type of preliminary water removal equipment should be used. This customer chooses the suction drum roll. This is a 30 in. drum roll with a 25 in. wide suction box and carries around 15 in. of vacuum. Another choice would be the suction drum press which is similar to this installation except it has a rubber covered top roll and a top felt. This arrangement adds pressing to the action of the vacuum, thus increasing the water removal. Both of these pieces of equipment must be driven, and both require large vacuum pumps and motors to hold high vacuum over so large a suction area. The third piece of preliminary water removal equipment is the combination of the plain and the suction extractor. In this case, the felt with the sheet underneath is passed over a wire covered roll similar to a very heavy cylinder mold. A top roll presses the sheet directly against the wire face and forces the water through the wire. This plain extractor is followed by a suction extractor which uses the same principle but adds the advantage of vacuum to help in the water removal. This suction extractor has a 3¾ in. wide suction box and should carry vacuums up to 15 in., but because of the reduced suction box width a smaller pump and drive can be utilized, thus reducing the operating expense. No drives are required on either the plain extractor or the suction extractor, thus further decreasing operating expense. In the case of this particular mill, the suction drum roll was selected in order to use a short top felt and to reduce felt marks on the lined surface. If it were not for this fact, a suction drum press or a plain extractor—suction extractor combination might have been used.





GEORGE F. HARDY & SON

Mill Architects & Consulting Engineers

441 Lexington Avenue — Established 1900 — New York 17, N.Y.

JOHN A. HARDY

AUGUST F. HARTMAN
THOMAS T. WHITTIER

Members—Am. Soc. C. E.; Am. Soc. M. E.; Eng. Inst. Can.; TAPPI.

Consultation
Reports
Valuations

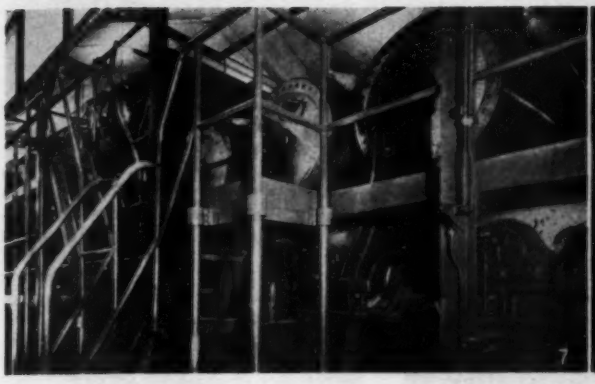
Paper and Pulp Mills
Hydro-Electric and
Steam Power Plants

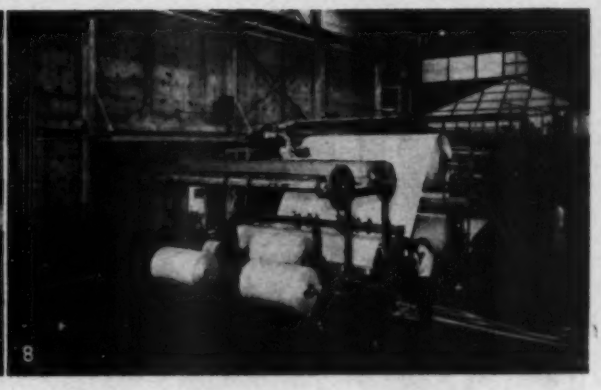
DESIGN—COMPLETE PLANS—SUPERVISION

Toilet Roll and Towel Roll Wrapping Machines

Write for complete information

THE PHOENIX GAGE COMPANY — Phoenix, New York





Top Felt Wash Box (Figure 4)

This is a picture of the press end of the vats and the top felt wash box. It also shows the drive for the first primary press, and the electric helper drives on each vat.

In the top felt wash box is a whipper, adjusting roll, showers, etc. to clean the short top felt. I am sorry the picture doesn't show more clearly the suction felt roll which does the final cleaning job on the felt before it comes in contact with the sheet. You can see the piping for this roll. This large section of pipe is the separator, the rear suction connection is made in the opposite side of this separator. The front connection for this same roll is shown going across the machine. The vertical pipe is the water leg and the air is exhausted on the other end of this inverted "U". This keeps the water from going through the vacuum pump and insures a constant vacuum and more efficient pumping.

Shows Press Section (Figure 5)

Here is the press section of this same machine, the vats are to the left. As stated before, the heavier sheets of paper, such as board, require special pressing techniques. The modern technique is to alternate the plain and suction presses. This has been found, by experience, to be the most successful arrangement. This machine has first, a plain primary then a suction primary, then a plain primary, a suction primary, a plain first press and a suction second press. By arranging the presses in this manner, the first plain primary brings the top felt into contact with the sheet and squeezes out a small amount of water. Then the first suction primary presses water from the sheet through the felt which is directly removed by the vacuum. However, larger amounts of water are removed from the felt than the sheet. The felt is really dryer than the sheet. The second plain primary equalizes the water in the sheet and felt again. It may also remove a small amount of water as the sheet by this time is dry enough to allow weighting of this press. The second suction primary then again removes more water from the felt than from the sheet. The plain first press again equalizes the moisture, and, since the felt is returned from this press, no further suction is applied to it. The second press is the final chance to remove water before the expensive job of drying begins, so all possible advantages should be used here, thus the suction roll.

Please notice the pneumatic loading cylinders, the motor operated broke conveyor and the suction felt roll with its water leg arrangement. This is the suction second press; notice the suction connection directly on the hollow press frame.

A Second Picture of the Press Section (Figure 6)

Here is another view of the press section. Here you can see the first plain primary, the second suction primary, the third plain primary, the fourth suction primary and the housing of the plain first press.

Shows Dryer Section (Figure 7)

This slide shows part of the 2-deck dryer section and part of the 3-deck section. It is customary to have the first few dryers 2-decked and the remainder stacked, or in three deck sections. This machine has 30 2-deck dryers and 60 3-deck dryers.

These dryers are all mounted on anti-friction bearings and are supplied with a circulating oil system. Notice the design of the dryers with the countersunk head bolts and the streamlined hand hole covers.

The framing is made particularly high so that no pit will be required. This is an advantage to which anyone who has handled broke from a pit can testify.

This STEBBINS Tank Leads A DOUBLE LIFE...

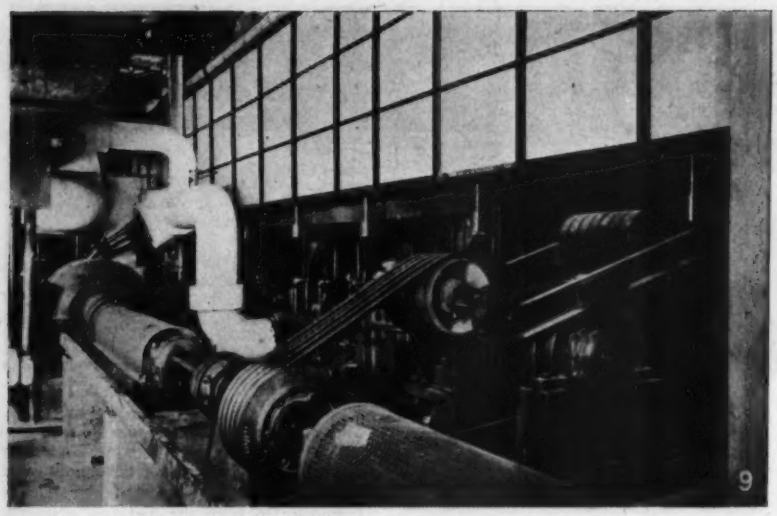
For example, one 40′ diameter Stebbins Semtile Tank is covered with a single span circular slab — supports two deckers, a conveyor and a building over the equipment.

Semtile tanks are actually *stronger* when they carry a load because compression is set up in the wall which materially aids in resisting temperature and shrinkage stresses.

Yes, Semtile tanks save space without compromising sound design.

When you have a tank problem, consult Stebbins.

Stebbins Engineering and Manufacturing Company
EASTERN BOULEVARD, WATERTOWN, NEW YORK



Shows the Dry End (Figure 8)

Here is the dry end of the same machine. The two calender stacks are almost visible. The hood is quite evident and the 4-drum winder in the foreground.

I haven't mentioned the 2-drum upright reel but that does have one very attractive feature which you will be hearing more about in the future. This is the regenerative braking device. It is an electric and full automatic way of obtaining a constant tension in the sheet when being wound and unwound.

Shows the Drive (Figure 9)

This machine is equipped with a sectional electric drive. However, the dryer sections are all driven from one large d-c motor in the center of a line shaft; this line shaft is on the machine room floor. Each section of dryers is driven from this line shaft by V-belts and veri-pitch sheaves. The draws are controlled by these vari-pitch sheaves. Of course, the sheaves drive a right angle spiral bevel gear unit which in turn drives the dryer pinion.

This machine has been in operation for some months and is now making 25 per cent more than its rated capacity of the finest, most level, best finished board of its kind.

New Papers and Their Uses in World War II

M. S. KANTROWITZ,
Technical Director
U. S. Government Printing Office

The paper industry played a very important part in the war effort in creating manufactured products which were never before made in the history of papermaking. Among such papers are safety or identifiable paper used in the rationing program, war prisoners' paper, federal war ballot paper, V...-mail writing paper, high wet strength paper, and fluorescent map and chart papers, which will be discussed here briefly.

Ration Paper

After the establishment of the War Production Board and the Office of Price Administration, ways and means were designed to bring about a program of rationing.

To protect this rationing program against forgery and failure, it became desirable to create new types of paper for printing ration stamps, so constructed as to make duplication extremely difficult and costly. Such a paper was made to contain secret identification characteristics which would positively establish its genuineness under tests.

Identifiable paper, as heretofore manufactured for use, generally as currency or bank note paper, had incorporated therein short red and blue silk fibers as a means of identification. These silk fibers are visible to the naked eye and are of origin foreign to the cellulosic fibers from which the paper is fabricated. Identifiable paper was also proposed wherein the mark of identification comprised fibers which fluoresce under ultraviolet light. In the printing of War Ration Book No. 1 for sugar rationing, and Book No. 2 for food rationing, precaution was taken to discourage the counterfeiting of stamps by incorporating into the paper structure such fluorescent cellulosic fibers invisible in ordinary light but visible under the influence of ultraviolet light.

In connection with the printing of subsequent war ration books, the Technical Division of the Government Printing Office engaged in research to develop identifiable paper which would distinguish genuine from counterfeit ration coupons other than the use of fluorescent fiber paper. We found that by incorporating ferric chloride-treated fibers into the structure of the paper which we termed "KG" fibers for security reason to the extent of 0.5 per cent, they will remain colorless and invisible in the sheet until treated with certain chemical reagents, such as potassium ferrocyanide and orthophosphoric acid. They then become visible and individually identifiable by acquiring a distinctive permanent blue color.

The characteristics of these "KG" fibers presented several advantages which are not obtainable with paper employing either silk fibers or fluorescent fibers. One such advantage of employing chemically treated fibers rather than silk fibers is that they are basically identical in composition with the untreated fibers comprising the entire sheet of paper. As compared with fluorescent fibers, paper containing the chemically treated fibers becomes practical for use in the field without necessitating expensive ultraviolet light equipment for tests. Another advantage of chemically treated fibers is that unlike fluorescent fibers, they do not lose their effectiveness upon exposure to sunlight, bleaching agents, acids, alkalies, water, oil, or gasoline, and they therefore remain in the paper structure as a permanent means of identification.

A description in detail of the preparation

ENGLISH ECCO CLAYS TRADE MARK CLAYS

UNIFORM • SUPERIOR • DEPENDABLE

English China Clays Sales Corporation
551 Fifth Avenue, New York City

of the chemically treated fibers and their incorporation into identifiable paper is given in U. S. Patent No. 2,379,443 dated July 3, 1945. During the late war, the manufacturing process was confined to only four paper mills which received contracts for the production of rationing paper.

War Prisoners' Paper

To guard against the sending of secret messages by war prisoners, by means of writing with invisible or sympathetic inks, the War Department presented the problem to the Government Printing Office to procure paper which would immediately develop writing with invisible inks into a visible form or visible characters without the application of heat or chemical reagents.

After some research with laboratory sheets, the Government Printing Office developed specifications for a coated paper, color sensitive to all invisible inks of either the acid or alkaline types. Among such substances are the citric acid of lemons, the lactic acid of milk, starch solution, sodium bicarbonate or baking soda, sodium carbonate or washing soda, or other substances which might be employed for secret message writing and might be commonly obtainable in war prison camps as common household commodities.

The sensitively coated paper which was first utilized in experiments, consisted essentially of a paper base coated with clay containing a chemical substance in the form of a mechanically incorporated dyestuff, which reacted when moistened or when written upon with an acid invisible ink to produce a green color. This paper did not react, however, to produce distinctly visible writing with alkaline invisible inks. Our search, therefore, led us to incorporate into the paper coating a second element which would react with alkaline solutions to produce a red coloration when the sympathetic or invisible ink happened to be of an alkaline nature. The paper manufactured on this plan immediately showed up the writing with acid or neutral invisible inks in green color, and with alkaline invisible inks the writing appeared in red.

Concerning the permanence of these developing colors, surveillance tests have shown that they will last for months, and surely a sufficient length of time to be clearly detected by censors. It is clear that the advantage of this device lies in the fact that a prisoner of war may be permitted to freely write upon this specially prepared so-called "Sensicoat" paper, a name given by the chemists of the Government Printing Office to describe the sensitive nature of its coating. The prisoner of war may write upon this paper with any kind of visible ink but cannot use any invisible writing inks since all of them—acid, neutral or alkaline or even plain water itself, will develop color when brought into contact with the paper.

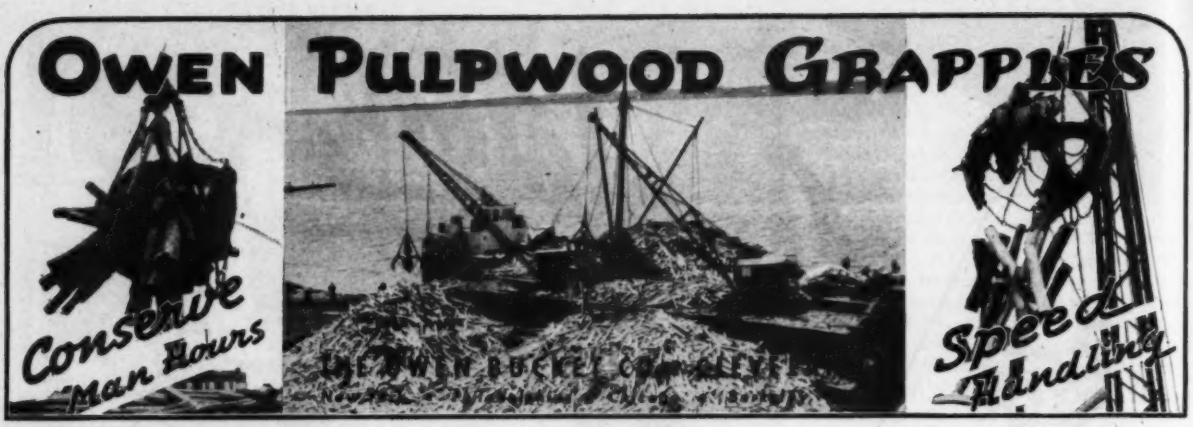
This type of paper was manufactured on a production basis for the printing of postal cards and stationery ordered by the War Department for distribution to war prison camps as a protection against the transmittal of secret messages by prisoners of war. These postal cards and the writing paper were printed with directions for their use in three languages—Italian, Japanese, and German.

The paper, as originally developed, was a fifty-six pound coated sheet (basis 17x22 inches per 1000 sheets), with the color sensitizer incorporated into the coating. Its high cost and heavy weight were factors influencing us to develop a lighter, uncoated, and much less expensive paper.

The requirements for such a paper were severe. It was to be an uncoated stock, strongly sensitive to writing with all types of solutions which could be used as sympathetic inks, as unreactive as possible to humidity and ordinary handling, but nevertheless capable of being manufactured at a substantially lower cost than the first paper used for this purpose. Intensive research revealed ways of meeting these requirements.

Samples satisfactory from a laboratory standpoint were made up, and approved by the War Department which then notified the Government Printing Office, that an order of stationery involving millions of sheets had been executed, and was to be made by the new process. This necessitated immediate action on the transformation of the process from the laboratory to the much more complicated plant production scale, and involved selecting the fastest and most economical method of applying the sensitizing formula, which would give an essentially white sheet and high color sensitivity to invisible inks when applied from a pen.

It was finally decided that the rotogravure press and the aniline press would both be satisfactory from those standpoints and, to further simplify and economize on the paper's manufacture, search was made for a manufacturer who could make the base paper, sensitize, and print it simultaneously, and then cut the forms and cards to the desired size. Although mills of such versa-



tility are rare, we found one paper manufacturer with not only these facilities but also having an ink department fully equipped with modern high grade ink grinding mills. This paper mill was contacted and readily agreed to lend its facilities to the experimental work necessary to the changeover from laboratory to plant production basis.

A series of laboratory and plant experiments were made ending in a completely satisfactory paper which could be made in one plant from start to finish, including the grinding of the special dye in the sensitizing formula. We termed the new paper "Anilith" War Prisoners' Stationery to differentiate it from the original "Sensicoat" War Prisoners' Stationery.

This paper served its purpose so well, that attempts to transmit secret messages thereon were, if not definitely halted, at least greatly reduced. The failure of this source of information which had been relied upon by German intelligence was apparently of sufficient important to force them to secretly instruct German prisoners of a trick method of secret writing, previously entrusted only to specialists in the field of espionage. The method worked as follows: A small amount of a plastic substance of putty-like consistency was hidden within packages of food, clothing, and other articles permitted to be received and distributed by the Red Cross to German prisoners of war. This plastic material, about the size of the head of a kitchen match, was accompanied the first time by a small scrap of printed paper which instructed the prisoner, to mold the bead on the end of a match or similar stick of wood, and use it as a pencil avoiding pressure. This method of writing left no visible trace on the paper, and the application of steam or ultraviolet light revealed no trace of secret writing. Such writing was capable of development with chemicals, by the recipient in Germany, into easily legible characters.

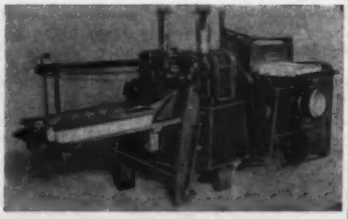
These were so-called "dry inks." Their analyses, when confiscated from prisoners, showed the greatest percentage of them contained about 0.5 per cent of a substance which, for security reasons, must here be called "Chemical X." Laboratory work was started to develop a paper which would detect minute amounts of this "Chemical X" when examined under the Geneva Conference Rulings, but which at the same time would retain its sensitivity to all liquid invisible inks.

The final result, with which the Office of Censorship was highly pleased, comprised an uncalendered, coated sheet processed with a water sensitive formula and included great sensitivity to the detection of "dry inks." The writing quality of this paper which we termed "Coatalith" is as good and the liquid invisible ink sensitivity better than the "Anilith" War Prisoners' Stationery which it superseded.

Federal War Ballot Paper

As a result of the passage of the Soldier Ballot Bill by Congress, it became necessary that forms be supplied the soldiers which could be readily and positively identified as genuine. The identifying characteristics of this paper were to be such as could be incorporated very quickly and with existing papermaking equipment. They were to be able to withstand the action of salt water, heat, and high humidity, and to require no complicated tests to reveal their presence. Several suggestions were made to the War and Navy Departments by which the Ballot Paper might be made to meet these requirements. Several samples were submitted to Army and Navy officials and upon their approval there was included in the paper a safety feature which consisted of printing, on both sides of the ballot, a design using an ink invisible under daylight or artificial light but which fluoresced brightly when stimulated by ultraviolet radiations.

Toilet-Towels
let
Lawtomatic
Roll Wrappers



(Model DD)

pace your production

The C. A. Lawton Company
Broadway-East DePere, Wis.

V . . .-Mail Writing Paper

When the V . . .-Mail service was inaugurated, the War Department requested the co-operation of the Government Printing Office in developing a paper suitable for overseas correspondence of the Armed Forces. This purpose demanded of the paper sufficient strength for endurance to handling in order to insure safe arrival when mailed to distant parts of the world and proper color for photographic reproduction upon miniature film. The red printed matter on the forms was required to reproduce well photographically.

The composition of the paper was approximately 30 per cent groundwood pulp and the remainder bleached chemical wood pulp.

It was necessary for the paper to possess sufficient brightness and opacity to produce good contrast with writing ink and not permit undesirable "show through." The brightness of the paper was specified to be between 66 and 70 per cent and the opacity to be not less than 93 per cent. If the specified brightness and opacity could not be obtained based upon the fiber content alone, it was stipulated that sufficient filler, such as titanium dioxide, should be added to the paper in the course of manufacture to obtain the specified values for these characteristics.

Characters written with ink had to be clear cut without feathering and this quality of the paper was determined by testing it with an ink consisting of an aqueous solution of a dyestuff. Good erasing quality was

assured by specifying "the retention of good writing quality and appearance of surface after erasure of written characters."

Because of difficulty experienced in photographically recording letters written with hard pencil and especially minutely written characters in order to obtain the largest possible message in the allotted space, it was necessary that the paper be suitably sized to obtain clearly visible characters written with a relatively hard pencil.

High Wet Strength Paper

Certain war purposes necessitated a paper possessing high strength and scuff resistance when wet. Such a paper was required for printing maps and training and instruction manuals for the Armed Forces for use under severe conditions not only on the ground but also in planes, tanks, and ships. It was, therefore, required to resist the effects of salt water, or rain water, or perspiration when carried by the sailor or soldier, as well as the grease and grime associated with motor vehicles.

To meet these unusual war conditions, it was necessary that the specifications for this type of paper include certain physical properties to provide for such extraordinary resistance.

High wet strength papers may be produced by treatment of the paper fibers with insoluble resins such as melamine-formaldehyde or urea-formaldehyde resins in the beater or at some other point of application in the papermaking operation prior to sheet formation. Weber (Experimental manufacture of paper for war map. *Research Paper* R. P. 1751, Vol. 37, December, 1946, U. S. Department of Commerce, National Bureau of Standards. Wet strength papers for modern war maps. *Chemical and Metallurgical Engineering*, Vol. 52, No. 3: 109, March, 1945) of the National Bureau of Standards, states "Best results are obtained by adding the solution to the stock at some point between the screen where coarse matter is filtered out and the point where the stock flows on to the wire. Excellent results are obtained by adding it to the stock as it enters the head box." When the resin is mixed with the paper stock, it attaches itself uniformly to the fibers and forms such a close bond that it cannot be washed free.

The application of melamine or urea-formaldehyde resins to paper fibers increases their wet strength from almost zero to about 50 per cent of their original dry strength as measured by the bursting and tensile strength after soaking in water for one hour at a controlled temperature.

The resin is effective on any kind of paper fibers. It may be applied to rag, sulphite, soda, sulphate or groundwood. The best results are naturally obtained when used with pulps made from such strong fibers as rag or sulphate.

Melamine or urea-formaldehyde resins are also used in the manufacture of blue print and brown print paper and in papers made for wrapping vegetables, meats, and other food products. The additional strength obtained by means of these resins permits the use of lighter weight paper for serving these purposes.

Fluorescent Map and Chart Papers

Certain substances are said to show fluorescence when they convert invisible ultra-violet light, commonly known as black light, into visible light of various colors, according to the nature of the substance upon which the ultra-violet light falls. Fluorescence continues only during the period in which the ultraviolet light is shining upon the material.

The cause of fluorescence lies in the pigments or dyestuffs which may be either organic or inorganic. Some organic pigments and dyes possess high fluorescent brightness and brilliant color but are subject to fading and loss of fluorescence on exposure to sunlight. The inorganic pigments, the class most commonly used, consist of zinc sulphide or combinations of zinc and cadmium sulphide. Such pigments must be of the greatest possible purity to insure best fluorescent brightness and color. The fluorescent color is a direct function of the pigment, therefore, many colors may be produced ranging from a light blue to a deep red depending upon the ratio of zinc sulphide and cadmium sulphide in the pigment, by the amount and kind of activating heavy metal used, and by the temperature employed in the preparation of the pigment.

The fluorescent property of these pigments is dependent upon their crystal structure, therefore, care must be taken not to crush the particles when making fluorescent products. With this proper precaution, the inorganic zinc sulphide or zinc and cadmium sulphide pigments can be ground in roller mills to make satisfactory printing inks; they can be dispersed in the coatings of paper or they can be incorporated into the structure of the paper itself.

The first fluorescent charts were printed by the offset process on ordinary map or chart paper using fluorescent inks of different colors. Later charts were also printed with ordinary offset inks on specially coated paper which itself fluoresces.

The special care necessary in handling fluorescent inks, the low resistance of the coated paper to handling, and the ease of destruction of the fluorescent coating by erasure, led to the development of a higher quality lithographic chart paper in which the fluorescent properties have been incorporated into the structure of the paper itself. With this newly developed paper, the printing of aerial navigation maps or charts involved no special or new technique for the lithographer. Any desired detail could be printed by the offset process using the customary lithographic inks. The entire paper sheet becomes luminous under ultra-violet or black light and so brightens the printed matter that it may be easily read in the dark.

Automatic Digester Controls

JOSEPH F. KEYES
North Carolina Pulp Co.

This paper covers briefly a recently completed program of the installation of automatic controls for digester pulping. A Mason-Neilan digester control system was installed on one of our digesters for experimental purposes and the collection of data regarding its operation. We were satisfied with the results obtained and ordered

Supercalender Rolls
Capacity up to 250" face

Embossing Rolls
Matrix rolls, paper or felt, and engraved rolls

Embossing Machines
Constructed for heavy duty work

Laboratory Calenders
Especially equipped for control or research work

Special Anti-Friction Installations
Permitting higher speeds on existing equipment

Crowned, Wormed or Flat Carrying Rolls
Dynamically balanced for high speed

The Wheeler Roll Co.
1910 Lane Blvd. Kalamazoo, Michigan

additional equipment to complete the installation on the remaining ten digesters.

The installation of this equipment was begun in October of last year and completed during the early part of February. This work was done by our meter and maintenance departments.

1) The water supply to the water purge line was changed from raw to filtered water.

2) The gas relief valve was installed backwards to make it easier to clean out if it became plugged with stock.

3) The solenoid that operates blow back valve was energized when it was gassing off, this was changed and energized when blowing back only.

There were no major changes made in the installation, it was just a matter of adjusting and calibrating by the factory representative to make them work properly.

At first we had trouble with the relief valve plugging with stock. After very much experimenting with gas-off screens, we had practically eliminated this trouble. We are now using 20 mesh stainless steel screens placed between the flanges in gas-off line just outside of the neck of the digester. We do not have any definite figures on maintenance of this equipment at this time. The meter department is spending approximately 3 man hours per day, for a meter man and helper adjusting and servicing the instruments.

The instruments have been in good working order since the last weeks in March and the results have been very satisfactory. A study of the records of the pulp mill operation from January, 1947 to the present date, shows the following facts and figures. From January to October, there were very few changes in cooking conditions. We were using approximately 5700 to 5900 pounds active alkali per cook for hard pulp, and 6100 to 6400 pounds active alkali per cook for the soft pulp, depending on the kind of wood being used at the time. The time to reach one hundred pounds pressure was one hour and twenty minutes, with one hour on pressure for a total cooking time of two hours and twenty minutes for the hard pulp. For the soft pulp, two hours to 90 pounds pressure, one hour and 15 minutes on pressure for a total time of 3 hours and 15 minutes. The total volume per cook for both pulps was 8500 gallons. In October, the installation of four new digesters gave us more digester time and enabled us to maintain production with a longer cooking time. The cooking of just the hard pulp was changed. The time to one hundred pounds pressure was increased to 2 hours, time on pressure one hour and fifteen minutes for a total of three hours and fifteen minutes cooking time. The active alkali was reduced to 5100 pounds and the total volume was increased to 9500 gallons.

Since the instruments have been adjusted, we are now using 5100 pounds to 5300 pounds active alkali for the hard side and 6200 pounds for the soft side. The total volume has been changed to 8500 gallons for the large diameter, 8000 gallons for the small digesters cooking hard pulp and 9000 gallons for the soft pulp digesters.

TAPPI Standard on the hard pulp during the past year has changed from 28.4 to 31.7 for an average of 30, and from 17.9 to 20.3 for an average of 18.6 for the soft pulp.

The steam consumption for the past year has averaged 3275 pounds per ton, so far in this month it has averaged 2730 pounds per ton. If this short time of operation is any indication of the instruments operation, we should save approximately 500 pounds of steam per ton of pulp. The instruments are duplicating themselves day after day. The human element of different cooks cooking differently has been eliminated. I am sure that most of you have had the experience of different cooks gassing differently and steaming differently from cook to cook.

The operation of our paper machines shows that we are producing a pulp of more uniform quality. I have talked with the paper mill superintendents and they say that the pulp is more uniform. They do not get the sudden change in freeness, the refining equipment does not have to be changed as often and the weight variation has decreased. The tests on the finished paper will substantiate their statements.

Correcting Some Flat Screen Problems—One Mill's Method*

DONALD L. CALKINS
Wausau Paper Mills Company

The purpose of this paper is to relate the actual experience one mill had in the solution of some rather common flat screen problems.

That mill's screening problems can be classed into three separate groups, in the order of their importance: (1) Dirt, (2) Capacity, (3) High Operating Cost.

These are rather broad terms and I think you will agree that they require further elaboration.

The word dirt, when used in connection with pulp and paper products, is a term familiar to all of you. Yet to say that pulp is clean or dirty without stating the relative amounts of foreign materials present is not necessarily conclusive. However, the quoting of actual dirt count figures may provoke a discussion on the controversial subject of dirt evaluation which is not within the scope of this paper. Therefore, I will take the liberty of making the statement that their pulp after screening was dirty.

The second item listed was capacity, and it too requires further explanation. This mill had continually increased its pulp producing capacity during the early war years like most other pulp mills. However, no changes had been made nor new equipment had been added to the screening system, and it began to be a bottleneck against any further increases in production. Physical mill limitations made it impractical, if not impossible to install additional screening equipment.

The high screen room operating costs mentioned were the result of several different factors. Because the screens were operated at full capacity, a shut down was required for all wash-ups and repair work. Sometimes these shutdowns resulted in a loss of production, but more frequently they meant that the non-productive repair or clean-up work was being done at the high Sunday wage rate.

Because the equipment was old and being operated at full capacity, the repair costs were excessive. The screen plate life under the operating conditions was short, and replacement was frequent and costly. Although it was not fully realized at the time, the power cost per ton of pulp screened was also high. All of these factors contributed to the high operating cost.

Certainly, dirt, inadequate capacity, and high operating costs are problems that are familiar to all of you. These same problems are quite likely to show up in any screen room where production is increased and little or no new equipment is added.

Now I would like to take a moment to discuss the method this mill used to do their screening work, and what equipment they had to do it with. In order to fully understand the problems and the changes made, it is necessary to have a picture of their operating conditions, the equipment used, and some of the other limiting factors involved. Their system of pulp cleaning was operated in four steps as follows: (1) Knot Screening (2) Riffling, (3) Primary Screening, (4) Secondary Screening.

The knotting was being done on two fourteen plate flat screens arranged in a single row and equipped with coarse cut screen plates. The stock was turbulently

(*) From paper read before the Northwestern Division of The American Pulp and Paper Mill Superintendents Association, held in Green Bay, Wis., June 18 and 19, 1948.

"HOLYOKE"
PULP and PAPER MACHINERY
Super Calenders
Laminators
Paper and Cotton Calender Rolls
Rotogravure Printing Equipment
Turbine Water Wheels and Parts
Filter Equipment
Special Machinery
THERE IS NO SUBSTITUTE FOR EXPERIENCE
HOLYOKE
MACHINE COMPANY
HOLYOKE, MASSACHUSETTS
DESIGNERS AND BUILDERS OF PAPER, PULP AND TEXTILE MACHINERY

Dependable steel products and unequalled steel service facilities . . . available for your steel-buying convenience at twelve conveniently located Ryerson plants. Because of great demand, all sizes are not always in stock; but we usually can suggest a reasonable alternate.

PRINCIPAL PRODUCTS

Bars • Structurals • Plates • Sheets • Tubing • Alleghany Stainless • Alloy Steel • Inland Safety Floor Plate • Bolts • Rivets • Metal Working Tools & Machinery, etc.

JOSEPH T. RYERSON & SON, INC.

PLANTS: New York, Boston, Philadelphia, Detroit, Cincinnati, Cleveland, Pittsburgh, Buffalo, Chicago, Milwaukee, St. Louis, Los Angeles

poured onto the head end of the line from a box above the screens, and dilution was accomplished by means of showers located above the stock flow.

A riffler was being used that was of little or no value as a dirt removing piece of equipment at the existing tonnage rate. It was deep and narrow and the stock traveled through it at such a high velocity that only the very heavy foreign materials could settle to the bottom.

Primary screening was being done on six parallel rows of flat screens consisting of three twelve plate units, or thirty-six plates, per row. Here again, as in the case of the knot screens, the stock was poured onto the first few plates with a great deal of turbulance. The dilution water was added from showers located above the screen plates. Because of the line lengths, it was difficult to keep the last plates from running dry. When this would happen, the dirt would pound through the screen plate slots and get into the accepted stock. The screens themselves were of the old cam and toe block design, which I am sure all of you have used at some time or another. The construction up to the diaphragm was metal, and the diaphragm chambers, flow boxes, screen vats, etc., were all made of wood. Diaphragm chamber outlets were cast integral with the screen frames, and were directly connected to the accepted stock flow boxes. Generally speaking, the metal parts of the screens were in fair condition, but the wooden superstructures were badly deteriorated.

The conditions of operation and of equipment on the secondary, or tailing screens, was about the same as on the primary screens. This step was being done on a single line consisting of two twelve plate units. The accepted stock from the first part of the line was being mixed with the accepted stock from the primary screens, and that which passed through the lower plates was being rescreened.

This should give you a fair picture of the problems, equipment, and operating difficulties that existed previous to any remodeling.

The program that was undertaken to correct these problems and conditions was divided into the same four parts as the cleaning system itself: knotting, riffling, primary screening, and secondary screening.

Since it is the intention that this paper cover flat screens and not entire screening systems, I will not go into great detail on the knotting and riffling steps, but will only mention them briefly.

A new consistency control unit and two knotter screens of the vibrating type were installed in place of the existing flat type of knot screens. The riffler was replaced with five new units, each eight feet wide, with felt lined bottoms. In the riffler installation, capacity enough was provided so that one unit could be shut down and cleaned or repaired, without loss of production.

In remodeling the primary screens, one line was taken at a time and there was little or no loss of pulp production during the construction period. The changes on the knotters, rifflers, and secondary screens had all been completed before work was started on the primary units, so the dirt problem did not get any worse than it had been.

All of the wooden work on the screens was removed, and the necessary repairs to cams, toe blocks, bearings, etc., were made. Then the screens were reset, using only two 12 plate units, or a total of twenty-four plates, for each line. In resetting, a space was left between the existing wall and the head end of the first screen, and between the two screens themselves.

At the entrance end of each line of screens, a head box with an apron board was installed. Its purpose was to level off the flow before it reached the first screen plate, and to make that flow laminar in nature. The box was designed so that the stock entrance was below the point of discharge, and it had two vertical baffles in it. Since the last pass in the box is a rising one, it has a tendency to float the large dimension speck materials. With the dirt at the top of the stream, the slot sizes of the first few plates can be greatly increased to give greater screening capacity, without fear of increasing the dirt count.

After the pulp has passed over the first twelve plates, it has been reduced somewhat in volume, and the consistency has been increased. With this in mind, a dilution well with an apron board was installed between the two screens. This dilution well is nothing more than a pit or recess below the screen plate line, and all of the dilution water is added from the bottom of the stream. The addition of water in this manner has a tendency to lift the speck material to the surface, the same as at the head box.

The apron then levels off the flow before it reaches the thirteenth screen plate.

During normal operation, the stock entering the screens, plus the dilution water added at the dilution well, is volume enough so that a stream passes over the twenty-fourth or last screen plate in the line. This prevents any drying up and pounding on the screen plates. The stock which flows over the tail end is not lost because it is sent to the secondary units for further stock selection.

Before rebuilding, the screens had diaphragm chambers for each pair of plates that were about nine inches deep, and each chamber had an outlet that was from twenty to thirty square inches in area. The depth was reduced to a little over six inches in the remodeling. Since the chamber outlets were an integral part of the screen frames, and could not be made larger, it was necessary to block them off entirely. New outlets were cut out through the sides of the chambers, and they were made twice as large, or sixty square inches in area.

Oblong metal castings in the shape of a reverse curve were then connected to the outlets, so that the point of discharge was approximately twenty inches below the top of the screen plates. The cross sectional area of these metal conductors was maintained at sixty square inches. The lower ends of these reverse curve castings were connected to the bottom of a collecting flume with individual seal chambers for each pair of plates built into it. These seal chambers were nothing more than rectangular compartments having a horizontal cross sectional area of one hundred square inches. A dirt trap was provided at the bottom below the stock entrance, and a dam built up almost to the top of the chamber established the point of discharge. The tops of the dams were built up of thin strips, and once the stock level for proper operation was determined, the dams were fixed. During operation the stock discharges over these dams into a common flume, and then to accepted stock storage. Because there is no adjustment of the dams required, the collecting flumes were covered with a tight fitting, but removable cover.

The drives on the old installation consisted of one motor for each two rows of screens, and transmission was through "V" belts to the first line, with a flat belt driving from there to the second line. It had been proved that this was a difficult set up to work around, and was not flexible enough, because a single line of screens could not be shut down. The drives were changed to individual direct connected gear motors with shock absorbing couplings between the gears and the first screens. This change provided greater flexibility, and a great deal more room.

The secondary screens were installed in two lines of twenty-four plates each. One line was adequate for the necessary capacity, but a second line was provided to give greater flexibility of operation. These screens were built in the same manner as the primary screens, except for a change in the accepted stock flow box. It is desirable to operate dry plates at the tail end of secondary screens, so that stock losses can be held to a minimum. To do this, a removable dam was put in the flow box, so that the stock which passes through the dried up plates can be separated from that which comes from completely submerged plates. In operation, the stock passing through the wet plates is accepted, and that which comes through the dried up plates is sent back to the head of the line for rescreening.

When the rebuilding program that this particular mill undertook was completed, all of their original problems and difficult operating conditions were partially or completely satisfied. The results can best be summarized by reviewing the original problems mentioned previously in this paper.

The dirt in the screened pulp was very substantially reduced, and was no longer a serious problem.

A combination of several factors increased the capacity of the screening system very materially. Larger chamber outlets, proper delivery of stock to the first few plates, the use of larger slot sizes, and the use of some stainless steel plates all contributed to this increase. Where it had been difficult to operate at an eighty ton per day rate before, it is now possible to screen at one hundred and ten ton per day rate on five of the six lines of screens. Perhaps a little better comparison of this capacity increase would be to mention that it previously required two hundred and sixteen primary screen plates to screen eighty tons, and it now requires only one hundred and twenty primary plates to screen one hundred and ten tons. This increased capacity allows the screen room to do their wash-up and repair work during operations, and without a slowdown of production.

There has not been enough experience as yet to conclusively prove that there will be a great reduction in screen plate replacement and repair costs. However, both of these are indicated so far. Screen plate life on the first screens that were completed is as long as it was previously, and since there are fewer plates, it would seem to indicate that the cost will be less over a period of time. Repair costs are, of course, quite low at the present time, because all of the equipment is quite new or has been recently rebuilt.

No exact figures are available on power costs either, but here again, a reduction is indicated. Now, during normal operation, only sixty primary diaphragms are being pumped, and each has only about five inches of water above it, while before there was a normal of one hundred and eight primary diaphragms being pumped, each with about eight inches of water above it.

▼

Esparto Pulp

Details are given for treating crude esparto with dusters, followed by cooking with aqueous sodium hydroxide, washing, thickening, and bleaching. The author also discusses the types of paper that can be made from esparto, with very brief reference to Spanish and British practice. Normally Algiers can supply 250,000, Morocco 125,000, and Tunisia 150,000 tons of esparto annually, hence the use of this raw material should become more general in France. J. N. Schaar, *Papeterie* 70, 2-3, 5 and 7 (1948) (In French).

Type GGU
Another Distinguished PUMP "by Aurora"
SIDE SUCTION CENTRIFUGAL
Capacities to 1400 G.P.M.
Heads to 190 Ft.
Wherever liquids play an important or incidental part in industrial processing, this Aurora Type GGU serves perfectly and with lasting efficiency. Because the casing is separate from the bearing bracket, the need for special metals to handle corrosives is minimized. Discharge may be placed in any of eight positions. We commend these pumps for high satisfaction and economy.
APCO TURBINE-TYPE PUMPS
For high pressure, small capacity requirements (up to 150 g.p.m.). Wide operating range characteristics. No metal to metal contacts. Handles non-lubricating liquids without wear. Only one moving part — the Impeller.
AURORA CENTRIFUGALS
for Every Pumping Job
HORIZONTAL SPLIT CASE
Single & Two Stage
SIDE SUCTION
VERTICAL NON CLOG SUMP
MIXED FLOW
SPECIAL DESIGN
Write for CONDENSED CATALOG "M"
or
Consult SWEETS
Write for CONDENSED CATALOG "M"
or
SEE OUR CATALOG IN SWEETS
AURORA Always PUMPS
AURORA
PUMP COMPANY
110 Loucks Street, AURORA, ILLINOIS

THE AMERICAN PULP AND PAPER MILL SUPERINTENDENTS ASSOCIATION, INC.

Recent Publications

"CHEMICALS USED IN THE PAPER INDUSTRY"

"PREVENTIVE MAINTENANCE IN PULP AND PAPER MILLS"

May be purchased from publisher:

H. S. Cobb Printing Company, Cumberland Mills, Maine

Association Office
220 East 42nd St.
New York 17, N. Y.

Branch Office
38 So. Dearborn St.
Chicago 3, Illinois

NEW EQUIPMENT AND SUPPLIES

Roof Cooler

A roof cooler that is quickly installed and economical to operate has been announced by Siegfried Ruppright, P. O. Box 6795, Los Angeles 22, Calif.

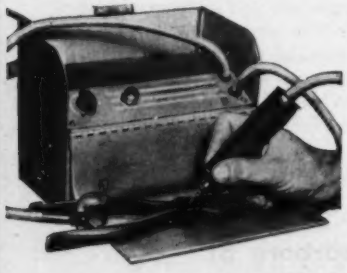
This device, known as the *R.R.R. Cooler*, consists of only a few sturdy, long lasting parts that need no readjustment and require no thermostatic controls or electrical connections. The nozzle is designed with so large a bore that it does not clog, and even the hardest water leaves no permanent deposits in or on the cooler.

The cooling operation is done by the thin film of water on the roof that is continuously renewed by the slowly revolving cooler as the old evaporates. The roof cooling effect is uninterrupted, rendering the roof cooler than the air itself at all times.

The manufacturer states the cooler does not inundate roofs or load them with a great amount of water.

New Model Electric Etcher

A new electric etcher, manufactured by Ideal Industries, Inc., Sycamore, Ill., will mark anything made of steel, iron, or their alloys, quickly and easily, according to the manufacturer.



Named the *Universal* model, the unit is enclosed in a streamlined, metal case for ready portability from one job to another. When opened, the cover forms a work plate on which to place small tools and parts for etching. A "C" ground clamp is furnished for use when etching parts that are too large for the work plate.

The etching tool does not get hot as with the ordinary etcher because the point is so mounted in the handle that cooling air can circulate around it.

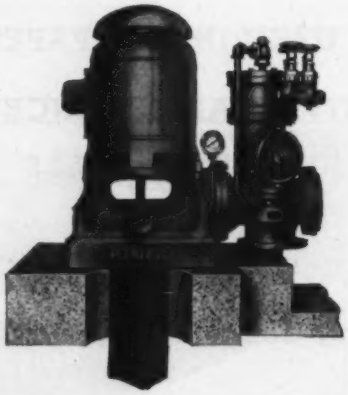
Four etching heats, 120, 240, 420 and 700 watts, make this etcher ideal for marking permanent identification on costly, hard-to-get tools and instruments, etching names on products, marking stock, part numbers and sizes, model, voltage or other information regarding use.

Vertical Turbine Type Fire Pump

Full approval by Underwriters' Laboratories, Inc. and Associated Factory Mutual Fire Insurance Companies has been granted to Peerless Vertical Turbine Fire Pumps, it has been announced by Peerless Pump Division of the Food Machinery Corp., 301 West Avenue 26, Los Angeles 31, Calif.

The approval of the vertical turbine type fire pump augments the extensive line of fully approved Peerless Horizontal Centrifugal Fire Pumps (formerly Dayton-Dowd).

Affording a reliable water supply for essential plant fire protection and especially designed for instant operation even after long periods of inactivity, this type of vertical turbine fire pump is practically imper-



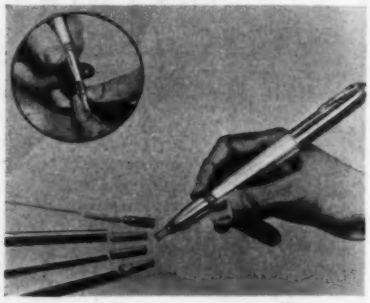
vious to deterioration, permits installation in minimum floor space and allows an extremely simplified discharge piping layout. They are available in capacity ranges from 500 to 2,000 gpm to operate against heads from 240 to 285 ft.

Peerless Vertical Turbine Fire Pumps are especially suited to pumping from wells, tanks, lakes, rivers or sumps. Owners have a choice of not only oil or water lubrication but also a choice of drives, either electric or right-angle gear drive, or steam turbine drive, as the Underwriters' Laboratories has approved both methods of lubrication as well as all above mentioned types of drive.

Fine and Broad Line Marking Instrument

A new automatic valve controlled pocket fountain brush for marking, drawing and writing on any surface producing a very fine or broad line by use of special adapter and four interchangeable hard felt nibs, is announced by Cushman and Denison Mfg. Co., 133-7 West 23rd St., New York City.

This new instrument permits fine markings on small packages and labels; excellent for pricing and marking on any surface as cellophane, metal foil, wax surfaces and fabrics, with choice of eight transparent instant-drying colored inks.

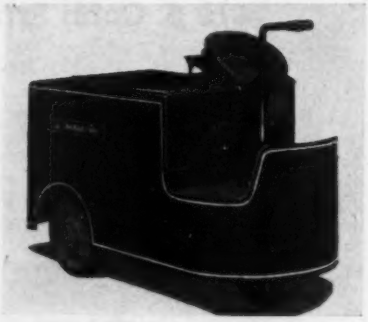


This multipurpose marking and drawing instrument can be quickly converted to make wide lines by removing fine mark adapter and inserting one of the various nibs, for marking freight, express and parcel post packages, including burlap and cotton bags.

Present owners of Flo-Master Fountnbrushes can modernize them by obtaining Fine Mark Adapters and Fine Mark Nibs.

New Small Electric Tractor

The Mercury Manufacturing Co., Chicago 9, Ill., announces production of a new compact, light-weight electric tractor to meet moderate industrial haulage requirements, i.e., those where trailing loads are not too severe, operating conditions are reasonably good and floor and elevator capacities as well as operating space are limited.



Designated as Model A-560-5, this new tractor is only 70 in. long (exclusive of coupler) and 34 in. in width. The weight of the chassis without power source is only 1450 lb. Light running speed is 6.5 mph. Normal drawbar pull rating is 200 lb. with maximum drawbar pull established at 1000 lb., which is sufficient to move a trailing load of 25 tons on smooth, level surfaces.

The standard power source for this chassis is a low type, 36 volt battery of 300 ampere hour capacity.

Construction features include double re-

eliminate

LOST TIME

descale clogged wires

with Oakite Compound No. 32

IF Fourdrinier wires are etched after descaling, you're in for serious downtime before paper gets running right again. That's why so many maintenance men recommend safe Oakite Compound No. 32 for descaling wire mesh clogged with hard-water deposits.

Paper pick-up after Oakite descaling is uniformly good because there's no etching action . . . no brightening of wire. Oakite Compound No. 32, fast-acting inhibited acid, soaks off the scale and leaves wire dull, DULL! For full, free details write TODAY! No obligation.

OAKITE PRODUCTS, INC., 16 Thames St., NEW YORK 6, N. Y.
Technical Representatives in Principal Cities of U. S. & Canada

MATERIALS
METHODS
SERVICE

OAKITE

REG. U. S. PAT. OFF.

Specialized Industrial Cleaning

FASTER · · · FASTER · · · FASTER!

25-W WINDER

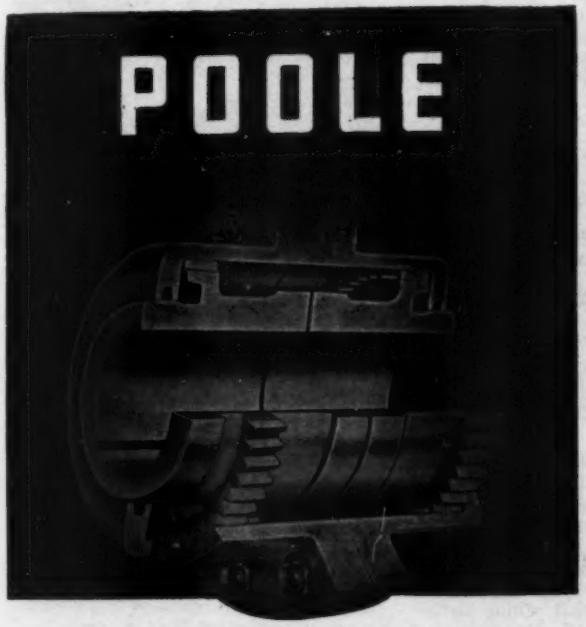
ROLL WINDERS

A new, high speed slitter and rewinder for converters of locker paper, shelving paper, household wax rolls, and paper and cellophane gift wraps. Produces perfect rolls with increased production and lower maintenance costs. Write for complete information.

HUDSON-SHARP

MACHINE CO • GREEN BAY • WIS

POOLE



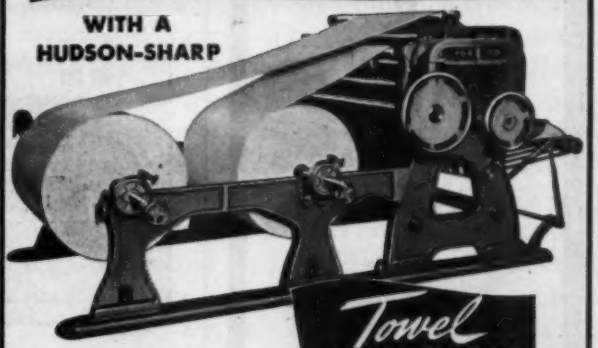
A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS

POOLE FOUNDRY & MACHINE COMPANY — WOODBERRY, BALTIMORE, MD

COINCIDE *Peak* PRODUCTION

WITH A HUDSON-SHARP



Towel INTERFOLDER

BUILDERS of folders and interfolders for the paper towel industry since the product was originated, Hudson-Sharp machines have been improved and redesigned to meet the increased production speeds required for post-war demands. Write for complete information today.

HUDSON-SHARP

MACHINE CO • GREEN BAY • WIS

for Still Greater
OPERATING
ECONOMY *and*
EFFICIENCY

Specify

DARNELL
CASTERS
&
WHEELS

A TYPE AND SIZE
FOR EVERY PURPOSE
★

DARNELL CORP LTD
LONG BEACH 4 CALIFORNIA
60 WALKER ST NEW YORK 13 N Y
36 N CLINTON CHICAGO 6 ILL

duction spiral bevel and spur gear drive axle with 18 x 3 solid rubber tired wheels, lever type single front axle steering with 15 x 3½ solid rubber tired wheels, full semi-elliptical spring suspension, mechanical contactor travel control and all-welded frame construction with a light-weight compartment which is quickly and easily removed for complete accessibility to the battery.

New Safety Goggle

A new type of safety goggle is being marketed by the Univis Lens Co., Dayton, Ohio. This product is the result of many years of research to find a material that would incorporate the lightness, comfort and added safety features of plastic but which would resist surface scratchings.

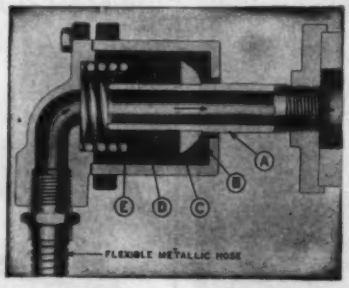
Safe-T-Vis is made of an allyl casting resin, a brand new kind of plastic for this use, meeting all these requirements. The fact that one Safe-T-Vis lens is approximately one-half the weight of a case-hardened glass lens permits workers to wear them without discomfort throughout the period of exposure.

These lenses are available in four goggle styles and in a selection of sizes.

In the manufacture of this lens, Univis employs the same methods, standards and control for which it is recognized in the ophthalmic field.

Self-Supporting Rotary Pressure Joint

A new development of the Johnson Rotary Pressure Joint has been announced by the Johnson Corp., Three Rivers, Mich. Known as the *Type-S*, it will be used like the standard Johnson Joint to admit heating or cooling agents to rotating rolls, particularly where considerable lateral movement of rolls is encountered, or where supports



for the standard Johnson Joint cannot be satisfactorily provided. It will find application in paper and textile mills, and in a wide variety of other processing plants.

The new Type-S is completely self-lubricating, has no packing of any sort, and adjusts itself automatically for varying pressures. It has a spherical sealing surface which maintains an effective seal even though wear should occur at this point.

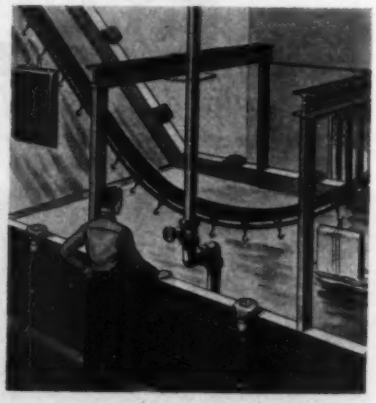
In this new Type-S a large bearing or guide of carbon graphite supports the entire weight of the joint. It is accurately fitted inside the body, where it provides a bearing surface on the rotating nipple. The seal proper is effected between a hemispherical collar on the nipple and another carbon graphite bearing ring. Pressure itself is the sealing force—the higher the pressure, the tighter the seal.

The carbon graphite used in the new Type-S is the special material used in Johnson Rotary Pressure Joints. It requires no oiling, since any moisture in the joint acts as a suitable lubricant. Standard construction has cast iron head and body with steel nipple. The Type-S is also available with bronze trim—bronze body and nipple—or all bronze with stainless steel spring.

The Johnson Type-S Rotary Pressure Joint can also be furnished to provide for syphon drainage pipes, to remove condensate through the same head that admits the steam. Four sizes are available—½ in., ¾ in., 1 in., and 1¼ in.—all suitable for 150 lb. pressure, temperatures to 400 Fahr. Full information and literature can be obtained by writing directly to the Johnson Corporation.

New Nozzle for Dip Tank Fire Protection

A new "L" type Multi-Jet nozzle, designed for smothering dip tank and drainboard flammable liquid fires with carbon dioxide gas has been developed by Walter Kidde & Co., 40 East 34th St., New York 16, N. Y.



The new "L" type nozzle is designed to emit fire-killing carbon dioxide in a fan-shaped blanket that hugs the liquid surface in tanks or along drainboards. It is equipped with a mounting flange for easy attachment to the top reinforcing angle with which most tanks are equipped. Depth of the nozzle from front to back is kept at a minimum by the new design (about 4¾ in. for ½ in. supply pipe) to permit installation of inlet piping close to tank sides.

Carbon dioxide fire protection installations on exposed tanks and drainboards formerly required complicated overhead piping and space-consuming horn type nozzle arrangement that often interfered with dipping conveyors and operators' movements near tanks.

Because of the flat, fan-shaped pattern of the carbon dioxide gas discharge put out by the new nozzle, more complete protection of tank liquid surface, or drainboards, can be achieved with fewer nozzles and less piping. Inspection, maintenance and cleaning are also simplified.

The Kidde "L" Multi-Jet nozzle is also recommended for screening door openings with carbon dioxide gas.

HERMANN CLAFLIN REFINER

FOR

CONTINUOUS

OR

CYCLE REFINING

•

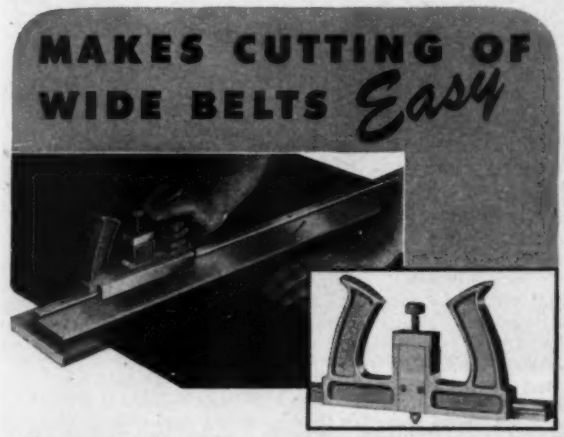
FOUR SIZES

No. 0	5 - 15 H.P.	600-900 R.P.M.
No. 1	50-125 H.P.	400-450 R.P.M.
No. 2	100-250 H.P.	350-400 R.P.M.
No. 3	250-400 H.P.	300-350 R.P.M.

Also:

TAPPI Standard Pulp Testing and Sheet Making Apparatus.

THE HERMANN MFG. CO.
LANCASTER, OHIO



Here is a tool that makes the cutting of wide conveyor and transmission belting a simple and easy job—it's the Alligator Wide Belt Cutter for cutting all belts (except those containing metal) up to 60" wide and 1⅛" thick.

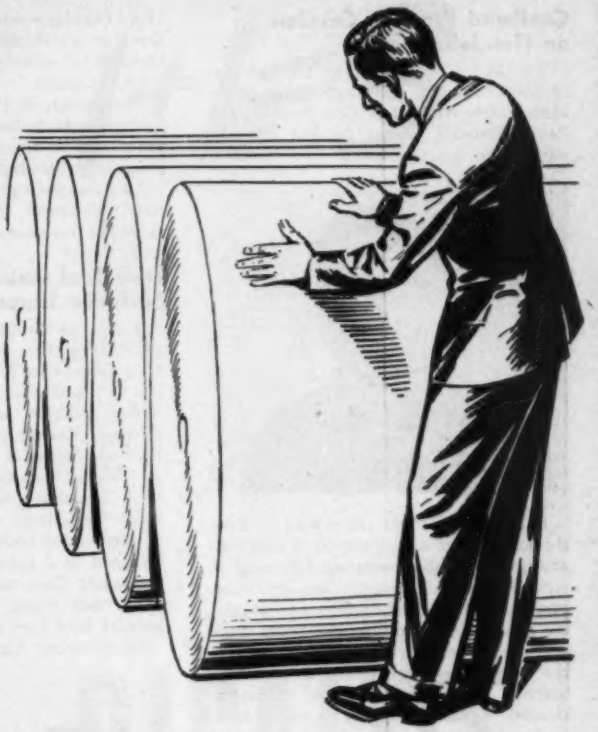
The guide rail is clamped or nailed to the belt and the cutter head is pushed across the belt. Each cut is made about ⅛" deep and with several rapid strokes the belt is cleanly and squarely cut.

Bulletin No. BC-350 gives all the details on this new cutter.

Order from your Supply House

FLEXIBLE STEEL LACING COMPANY
4606 Lexington Street, Chicago 44, Ill.

Also sole manufacturers of Alligator Steel Belt Lacing for transmission and conveyor belts, Alligator V-Belt Fasteners and Flex V Fasteners, for V-Belts, Flexco HD Fasteners and Rip Plates, and Hinged Flexco Fasteners for conveyor belts.



Here is where good Calendering counts

Examine the paper as it comes from the Calender Stacks. The final finishing which differentiates grades and qualities has been carried out. The finished sheet is ready for sale. Here is where good calendering counts. When you use Butterworth Calender Rolls the result is a superior sheet. You're sure of outstanding calendering results because Butterworth Rolls are made to specification from only the finest material and tested for hardness, smoothness and density before delivery. Remember, the finish on the paper can only be as good as the rolls in the calender. For proper finish and extra hours of service, standardize on Butterworth Calender Rolls. Furnished new or refilled for every make calender. Write us today.

For full information, write or call H. W. Butterworth & Sons Company, Philadelphia 25, Penna. — Providence Division, Providence, R. I. : : Charlotte, N. C., 1211 Johnston Building In Canada—W. J. Westaway Company, Hamilton, Ontario

Butterworth Calender Rolls

Coolband Provides Comfort on Hot Jobs

The M.S.A. Coolband, an efficient perspiration retainer, has been designed by Mine Safety Appliances Co., Pittsburgh 8, Pa., to provide greater comfort for men working on hot jobs.

Fitting comfortably all-around-the-head, the soft, sponge rubber Coolband constantly absorbs perspiration, creating a cooling effect. By preventing perspiration from dropping into the eyes and on glasses or goggles, the M.S.A. Coolband promotes better working comfort and efficiency. Light in weight, the Coolband clings gently to the head without binding. It may be thoroughly cleaned by hand-squeezing in soapy water and may be sterilized by the same method, using customary germicidal solutions.

PA Oscillating-Trough Conveyor

Following actual installations, Link-Belt Co., Chicago, now announces a new conveyor called the Link-Belt *"PA," Positive-Action Oscillator,* for the economical handling of a wide variety of materials in a horizontal path.

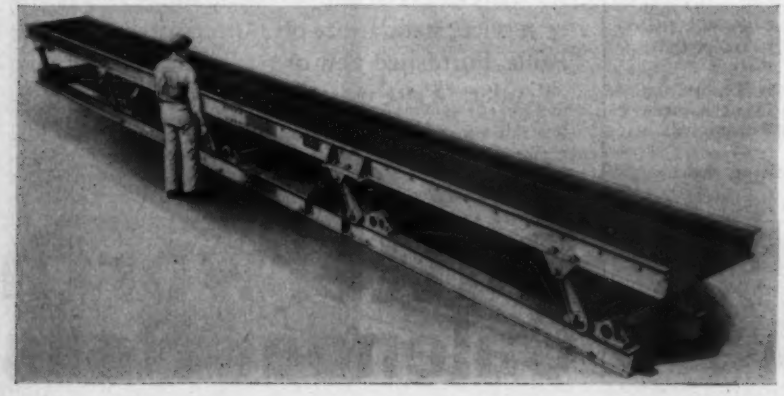
The new "PA" Oscillator is a positive-action, roller bearing, eccentric type oscillating trough feeder-conveyor, driven by a Link-Belt Electrofluid Drive through a chain or V-belt reduction to the machine's eccentric shaft and connecting rod assembly.

It is available in standard trough widths of 12 to 48 inches to suit the capacity desired and character of the material to be handled—and in single trough lengths of up to 100 ft.

For longer carrying runs, two or more units may be arranged in series, one discharging into the other, and each equipped with an individual motor driven.

Besides conveying material, the new "PA" Oscillator may also serve as a cooler, dryer or conditioning unit when jacketed, louvered or otherwise constructed for the service intended.

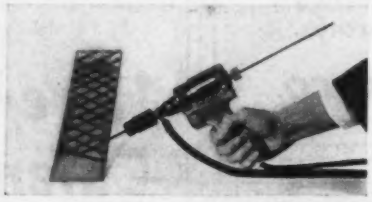
The trough is either pan type or constructed with channel steel sides. The standard trough is leak-proof and can be furnished with dust-tight covers or constructed for air and gas tight movement of the material. Conveyor trough can also be fabricated of corrosion and heat resistant metals.



New Tool Makes Metal Surfaces Slipproof

A new tool manufactured by Metallizing Engineering Co., Inc., 38-14 30th Street, Long Island City 1, N.Y., provides a simple low cost method of preventing slipping and falling accidents on smooth steel or iron surfaces. Known as *Ruf-Tred,* a vibrating electrode holder is used with either a-c or d-c welding machines to deposit hard rough bead lines about ⅛ in. wide and 1/16 in. high. On a large area, the bead lines are usually spaced several inches apart and are arranged in a geometrical pattern such as diamonds. On a small area like the nosing of a stair tread, several closely spaced parallel bead lines are usually deposited.

In operation, the end of the electrode is



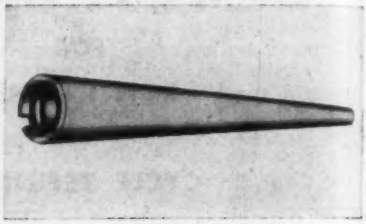
placed in contact with the surface to be roughened and drawn along at approximately 5 fpm. It is not necessary to "hold" an arc, as in welding, since the vibrator causes intermittent arcing, which melts the end of the hard steel electrode and fuses the molten droplets to the base. The deposited metal is extremely hard and retains its slipproof qualities, even when wet or oily.

Aluminum Paper Cores

Paper stock cores of aluminum are now being manufactured by Hubbard Spool Co., 1620 Carroll Ave., Chicago 12, Ill.

These cores are made of Reynolds heat-treated aluminum alloy tubing, reinforced at the ends with special steel inserts. They are very light; in one standard size the tube weighs only 35 lb. as compared to an 85-lb. cast iron core formerly used for the same size paper roll.

The aluminum tubing is impervious to rust or other corrosion, and because of its high strength, it stands the rough treatment



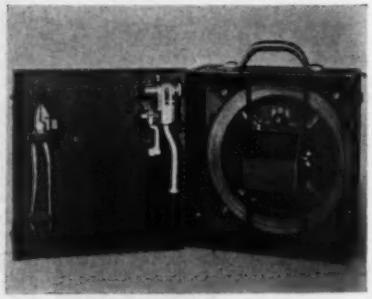
to which cores are sometimes subjected to in transit. Since the aluminum tubing cores are precision extruded, they are proof against warping. Consequently they remain true and feed paper from the roll evenly, down to the core.

The company is currently manufacturing these cores in standard 4-in., 5-in., and 6⅜-in. OD sizes, but is prepared to quote on other diameters.

Portable Lightweight Kit Dispenses Strap

Complete steelbinder strapping equipment packed in a lightweight steel kit called the *Strap Kit* is announced by A. J. Gerrard & Co., 221 N. LaSalle St., Chicago 1, Ill.

Carried like a small brief case, the *Strap Kit* contains a Steelbinder Strapping Reel, and Cutter, and can carry enough coiled strapping and seals to handle several jobs without a refill. The *Strap Kit* provides a practical and economical means of carrying strapping equipment to out-of-way points



of use. It eliminates wasteful "estimates" on the amount of strapping needed for such work by dispensing at the point of use exactly the length of strap required. The strapping is unreeled through a small slit in one end of the steel case, a feature particularly attractive to outdoor workers.

Stack Gas Indicator

As a guide to more efficient combustion, the Davis Flue Gas Analyzer for continuously indicating and recording stack gases is being introduced by Davis Emergency Equipment Co., Instrument Division, 45 Halleck St., Newark 4, N.J.

This instrument analyzes the composite of stack gases and gives a continuous indication of the completeness of combustion. It indicates if too much air or insufficient air is provided.

PHOTOVOLT
Photoelectric REFLECTION METER

For accurate measurement of

BRIGHTNESS
GLOSS
OPACITY
COLOR

of paper and paper products.
Portable, rugged, simple to operate.

Write for literature

PHOTOVOLT CORPORATION
95 Madison Avenue New York 16, N. Y.

Every Coes Micro-Ground paper machine knife is made under scientific control. The Coes reputation for long service between grinds is the result.

Coes is always at your service.

LORING COES COMPANY
Established 1830
MACHINE KNIVES
WORCESTER MASSACHUSETTS

DICALITE
Paper-Aids
make the boy right, professor!

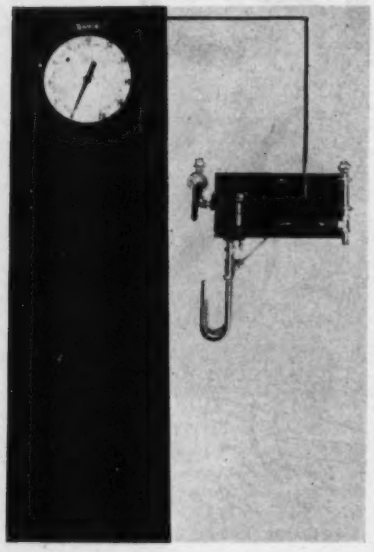
Here's how. In sheets containing insoluble pigments and ordinary fillers, Dicalite inert diatomaceous paper-aids have another "double-service" effect. The addition of a small percentage of Dicalite increases the retention of and extends such materials so that one part pigment and/or filler plus one part Dicalite GIVES YOU UP TO THREE PER CENT ASH! That's legal inflation!

ASK FOR FULL INFORMATION

THE DICALITE COMPANY
DIVISION OF GREAT LAKES CARBON CORPORATION
NEW YORK 17 • CHICAGO 11 • LOS ANGELES 14

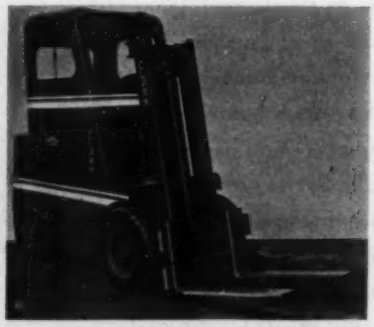
DICALITE
PAPER-AIDS FOR BETTER PAPER PRODUCTS

The Analyzer consists of a recorder and panel 2 ft. wide by 6½ ft. high and a Davis Flow Panel to be mounted near or at the point of sampling. It is electrically operated from 110 volt, 60 cycle power supply employing a Wheatstone Bridge and a specially designed stainless steel analysis cell for measuring the thermal conductivity of the composite stack gases.



Cab for Fork Truck

A welded steel, sound-insulated, all-weather cab for use on the *Yardlift-40*, pneumatic-tired fork truck, is announced by J. H. W. Conklin, sales manager of the Tructractor Division of Clark Equipment Co., Battle Creek, Mich.



The cab is fully enclosed, with entrance door on the driver side. It is equipped with sliding windows, safety glass throughout, and an upper window of glare-proof glass to aid high stacking. The interior is finished with a sound-deadening, insulating compound. Rearview mirror and windshield wiper are standard equipment; and a hot water heater is available as extra. The cab is easily mountable for field installation.

Paint Spray Gun

An entirely new paint spray gun has been announced by American Brake Shoe Co., Kellogg Division. Exclusive features of the *Micro-Spray* (trade marked) paint gun reduce costs and increase production by saving money, saving paint, saving air and saving time.

The new, smoother, higher-gloss finish produced by finer atomization and more even paint distribution is made possible by a more uniform flow of air and paint. Detrimental effects from air pressure drop and eddy currents have been eliminated by designing ample air passages in the gun body, and by providing for precision, uniform flow and size of air streams from both wing jets and center orifice. The result is shallower valleys between finer microscopic paint globules and more uniform distribution.

The fourteen engineered extras of the Micro-Spray gun give the user greater versatility and more ease in handling. Simplicity of design saves expensive cleaning and assembly time.

Glowing Safety Signs

A phosphorescent, or so-called "luminous" safety signs are now made by the Nulite Displays Company, 15 East 26th St., New York City. These glowing safety signs minimize the hazard of power failure. They are visible in total darkness long after the usefulness of ordinary signs has ceased and they serve as ordinary signs in bright light or daylight.

In addition to the signs illustrated, markers may be had pointing to fire escapes, first-aid stations, and other vital points in a building or plant.

Rope Coupler

A rope coupler which may be used for connecting broken carrier ropes is known as the *Staytite Coupler*. This coupler is made by The Eagle Belting & Leather Co., 1401 Central Parkway, Cincinnati, Ohio.

It is easy to install; the right coupler can be furnished if the diameter of the rope to be coupled is given. The illustration shows the steps in coupling the rope: (1) the coupler; (2) cotton rope-coupler started on rope; (3) braided rope-coupler started on rope; (4) coupler in place on ends of braided and Manila rope; (5) Nylon rope with coupler attached.

Nylon-Reinforced V-belt

A nylon-reinforced V-belt which it is claimed has twice the strength and four times the average life of conventional V-belts has been developed by United States Rubber Co.

The belt contains a series of tough nylon cords covered with a special synthetic rubber compound capable of withstanding the deteriorating effects of heat and oil. It is particularly recommended for power transmission on equipment subject to rough usage, such as grain harvesting and processing combines and railroad, mining, oil well and paper processing machinery. In addition to high tensile strength it has great flexibility and a sufficient amount of elasticity to absorb shock, the company said.

The new belt will be distributed under the name of *U. S. Royal Super Service V-Belt*. It will be made in fractional and multiple sizes.

SINCE 1828

SINCE 1828 The Smith & Winchester Mfg. Co. has been serving the paper and paper bag industry with custom machinery to meet the ever increasing demands for larger volume production of paper and paper products at lowest possible manufacturing costs.

The SMITH & WINCHESTER Manufacturing Company
SOUTH WINDHAM, CONNECTICUT

SULPHITE MILL ACID PLANTS

SULPHUR BURNING PLANTS
JENSSEN TWO TOWER ACID SYSTEMS
GAS COOLERS—SURFACE AND SPRAY TYPE
JENSSEN PRESSURE ACID SYSTEMS
JENSSEN AUXILIARY PROCESS TOWERS
RECOVERY PLANTS—COOKING ACID

SOLUBLE BASE ACID PLANTS
SEMI CHEMICAL PLANTS
JENSSEN SO_2 ABSORPTION SYSTEMS

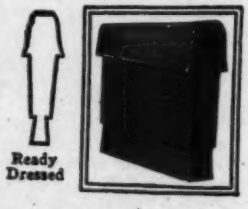
FOR BLEACH PLANT APPLICATION
SULPHUROUS ACID PREPARATION

G. D. JENSSEN CO. INC.
WATERTOWN, NEW YORK
WESTERN REPRESENTATIVE:
A. H. LUNDBERG, Textile Tower, Seattle 1, Washington
FOUNDED 1915

"READY DRESSED" MILL COGS

LABOR SAVING — TIME SAVING

The Most Economical Filling That Can Be Put in a Mortise Wheel.

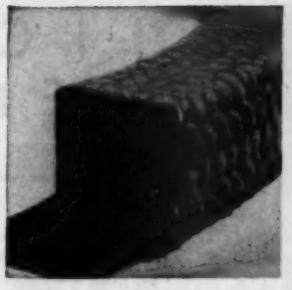


We Make Any Style or Size Wanted.

Write for Instruction Sheet "C" Which Is Free.

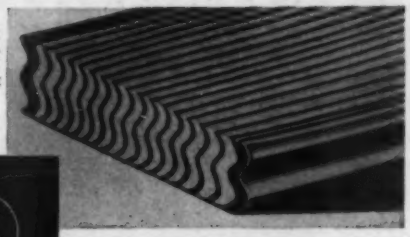
QUICK SERVICE ON ALL SIZES

THE N. P. BOWSHER CO., South Bend, Ind.



Upper left: GARLOCK Lattice-Braid Packing

Upper right: GARLOCK Chevron* Packing



Lower: GARLOCK Guardian* Gasket (Cross section view)

*REG. U.S. PAT. OFF.

Great Performance

Typical of the exclusive Garlock quality controlled products which are establishing Great Performance records on many thousands of applications are these:

Garlock *Lattice-Braid*—a patented braided packing, made of asbestos, flax or cotton—in which all strands are lattice-linked together into a sturdy and flexible unified structure.

Garlock *Chevron* Packing—an automatic packing made of asbestos or cotton base materials—accurately molded into rings of any size. Chevron packs high pressure jobs or low pressure jobs with minimum friction and wear.

Garlock *Guardian* Gaskets—spirally wound metal and asbestos—are extremely resilient. Recommended for use against the highest temperatures and pressures.

THE GARLOCK PACKING COMPANY
PALMYRA, N. Y.
In Canada: The Garlock Packing Company of Canada Ltd., Montreal, Que.

GARLOCK PACKINGS

TECHNICAL DEVELOPMENTS

These abstracts are of the latest developments found in the American and foreign press.

Testing "Wettability" of Papers; the Netzometer

The author, after discussing the concept of wettability ("Benetzung") in terms of interfacial tension and of the capillarity of paper, describes a new instrument which he terms the "Netzometer" and which is used in determining wettability. Essentially the netzometer consists of a sturdy fairly wide-mouthed glass bottle about 13 cm. in height, wider at the base than at the neck, and having a capacity of well over 150 cc. This bottle is equipped with an easily removable iris diaphragm, such as that used in microscopes, which may be fully opened by a side release. The central aperture of this diaphragm, when closed as fully as possible, fits snugly around a metal rod, 6mm. in diameter and about 16 cm. in length. To the lower end of this rod is fastened a circular plate, which can rest on the bottom of the glass bottle. The upper, rounded end of the rod extends about 3 cm. above the diaphragm. Paper samples that are to be tested are cut out by means of a puncher, which operates in such a way that it cuts out a circular leaflet, having an over-all diameter of 30 mm. and a central circular perforation of 8 mm. in diam. These paper samples are suitably air-conditioned and their edges are carefully flattened out so as to obviate turned-up rims.

In carrying out the test, the rod and diaphragm are first removed from the bottle, and 150 cc. of the test solution are introduced into the container. This solution consists of 10 g. Nekal BX per liter of water. Thereupon the rod and the diaphragm are replaced and the latter is closed as completely as possible. The circular test sheet is then slipped over the rounded end of the rod and comes to rest *on* the diaphragm. When the latter is opened the test sample falls smoothly down the rod, to rest flatly on the surface of the test solution. As soon as the sample touches the solution, a stopwatch is started, and the number of seconds elapsing between the time that the sample strikes the surface of the solution and the instant it *begins* to sink are recorded. This time interval serves as a measure of the wettability. The same solution may be used for as many as 100 tests. Each paper is normally tested six times (using three circular samples for either side of the sheet). Drawings to scale are given of the netzometer and the puncher. Usually the checks were very good and the tests were entirely reproducible. In no case was the test extended beyond one hour. Whenever it took more than an hour for the paper sample to become sufficiently "wet" to sink in the liquid, the result was recorded as "over 3600."

The author furnishes data on the increase in the time of wetting with increased time of beating and with the degrees Schopper Riegler (S.R.). However, even when beaten in a Jokro mill to 89 deg. S.R., unsized sulphite pulp sheets showed an average test of 1180 secs., and unbleached unsized soda pulp showed a test of 1855 secs. Unbeaten sulphite pulp (13 deg. S.R.) was wetted within 147 secs. and unbeaten soda pulp (14 deg. S.R.) within 430 secs. Rosin-sized sulphite pulp sheets reached the 3600 sec. limit after beating 40 mins. to 52 deg. S.R. Rosin-sized soda pulps however, did not reach this point until beaten 150 mins. to 83 deg. S.R. Various treatments for rendering papers impervious or at least less susceptible to wetting have been correlated with the simple test described above, and so the test serves as a control in such treatments. August Noll, *Wochbl. Papierfabr*, 75 128-31 (1947) (In German).

French Colonial Woods Used in Experimental Pulping

The authors report on some of the pulping experiments made on woods taken largely from the Audouin Forest (of the Lower Ivory Coast, in Africa) under the auspices of the newly created Regie Industrielle de la Cellulose Coloniale (R.I.C.C.). It was shown that mixtures of widely different species could be cooked together quite successfully by the sulphate process, even when such mixtures included woods which (when cooked alone) were delignified with difficulty. About 25 species were studied, but the authors give very few details. Sulphite digestion proved unsatisfactory and in general soda cooks were also inadequate. Four photomicrographs are included (for two samples of wood).

Up to the present no bleaching studies have been reported, but the authors believe that in some cases the woods may prove suitable raw materials not only for wrappings but also for writing and printing papers. P. leCacheux and R. Peterie. *Bull. Assoc. Technique de l'Industrie Papetiere*, 2, 22-33 (1948) (In French).

The Copper Number of Pulps

The author has made a critical, comparative study of the copper numbers of various cellulosic materials, using the methods of Schwalbe, of Haegglund, and of Braidy. Of these, the Haegglund method gave the best results provided certain precautions were taken, and when the following modifications were made. The sample, which should be dried at (or below) 80 deg. C. should be rasped and should be added to the boiling reagent (*i. e.* the alkaline copper solution) with which it is kept in contact at the boiling point, for exactly 3 minutes. The mixture is then poured directly into 400 cc. of cold water, and is filtered through a suitable crucible, and the cuprous oxide is then brought into contact with standardized ferric sulphate, and the resulting ferrous sulphate is titrated with standard permanganate solution (Cf. Haegglund, *Papierfabr.* 17, 301 (101)).

The present author has found it essential to run a control in the absence of cellulose, so as to ascertain the attack of the reagent on the filters. Schwalbe's method was slower than Haegglund's and Braidy's method was very slow and gave fluctuating results. The following average copper numbers were obtained:—for bleached linters, 0.0375; for ashless filter paper, 0.305; for fluted filter paper, 2,775. Asbestos and glass wool both gave appreciable copper numbers ever after careful purification.

The authors findings were fully discussed by other members of the French Pulp and Paper Assoc. and some of the results were subjected to rather sharp criticism. G. Ulrici. *Bull. Assoc. Technique de l' Industrie Papetiere*, 2, 11-22 (1948) (In French).

Detection of Multiple Laminations in Board

The author has devised a mild treatment by which a board with multiple laminations can be separated into its various component layers, without injury to the paper, each layer of which may then be examined further. The sample is immersed in an aqueous solution containing 10 grams of Nekal BX per liter of water, at a temperature of 50 deg. C. Usually within a few minutes (but depending on the type of board used) and also on the adhesives and pressures employed in board manufacture) the layers can be separated from each other.

Although Nekal BX was shown to be the best over-all reagent, other surface active substances (especially Leonil SB. extra) were very effective in separating board laminates. August Noll. *Wochbl. Papierfabr.* 76, 85-6 (1948) (In German).

A Universal Instrument for Studying Paper Tensile Strength

The instrument is of the chainomatic type with photoelectric control. It permits recording stress-strain diagrams at a constant rate of elongation or of loading. It also permits studies on creep and relaxation at constant elongation. The test strip is placed in a conditioned cabinet. The length of the strip can be varied up to 750 mm. Elongation can be measured to the nearest 0.001 mm., and the stress can be determined to the nearest 7 grams. The construction of the instrument is shown diagrammatically, and two half-tones show that section of the instrument which holds the balance. Arrangements for applying strain, and the photocell and relays for the balance are also shown in appropriate drawings.

So that there may be an automatic record of diagrams for the application and release of strain, the instrument is equipped with contacts which, when touched with a pointer on the chain, will reverse the direction of either the elongation or the load. Another illustration shows the battery of relays which directs these changes. Usually the instrument is used at a constant rate of elongation which is rather low. This low rate is needed on releasing the strain, because the rate of "creep" is also low. The instrument finds a use in rheological studies of paper. B. Invarsson and B. Steenberg. *Svesnsk Papperstin.* 51, 23-30 (1948); through *Bull. Inst. Paper Chem.* 18,542 (1948) (Original in Swedish, with English summary).

LEADING PAPER MILLS Use Papermakers'

D-I-LESTOIL

(In cooking, washing or pulping)

for...

1. DE-INKING — newsprint, magazine and ledger papers.
2. DE-WAXING — cotton linters — waxed papers.
3. DE-GREASING — rope stock — cotton mill sweeps.
4. REMOVAL of — Asphalt — Pitch — Adhesives — Sizing and other troublesome soil from all raw stock.
5. DEFIBERING — because of its excellent wetting, emulsifying and dispersing action.
6. KEEPING SYSTEMS CLEAN — Felts — Wires — Washers kept clean and costly shutdowns avoided.

CLEAN RAW STOCK MEANS BETTER PAPER

Prove it in your own mill. Write today for FREE working sample of this unequalled cleansing and wetting agent.

Dept. P-2

ADELL CHEMICAL CO.

HOLYOKE, MASSACHUSETTS

ORISKANY WATERBURY FELTS

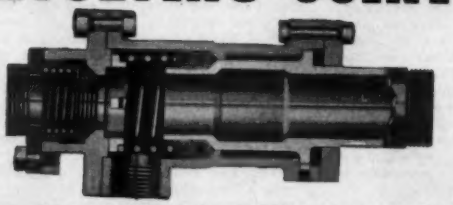
MADE BY

H. WATERBURY & SONS CO.

ORISKANY, N. Y.

GUARANTEED LEAK-PROOF "DIAMOND"

REVOLVING JOINTS



Permanently end leaking and stuffing box trouble on all kinds of Steam-Heated and Water-Cooled Rolls. No tight packing to act as brake on roll. Patented construction. Specially compounded molded gasket lasts up to 15 months in severest service — easy, quick and inexpensive to replace.

Write for Bulletin and Price List

DIAMOND METAL PRODUCTS CO., 406 Market Street, St. Louis 2, Mo.

NEARLY ALL PAPER MILLS USE BOWSER LUBRICATING SYSTEMS

Because——

- Bowser's 63 years of development and field engineering experience have given Bowser Lubricating Systems DEPENDABILITY.
- Design and application have kept pace with technical advances in the papermaking industry. Bowser systems are as modern as the machines they lubricate.
- Each component part of a Bowser system is built for one purpose—safe, sure, efficient and continuous operation of the complete system.

For lubricating systems to meet the EXACT REQUIREMENTS of any paper mill—central systems or compact, self-contained units for individual machines—call Bowser.

BOWSER, INC.

1315 Creighton Ave., Fort Wayne 2, Ind.

LIQUID CONTROL SPECIALISTS SINCE 1885

New Catalogues and Publications

Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.—In a four-page bulletin, No. 08B6725, released by this company, is described a new Hi-Density feeder developed by them. It explains where and how it can be used in the pulp and paper industry. Specifications of the unit are also included. Copies are available on request from the Allis-Chalmers Mfg. Co.

The American-Marietta Co., 43 E. Ohio St., Chicago, Ill.—The Valdura Division of this company has issued a booklet of charted guides to answer painting questions in the paper industry. Correct primers and finish coats for every use in all types of paper mills are explained in charts. Conditions peculiar to paper mills are taken into consideration, such as resistance to caustics, acids, heat, moisture, steam and abrasion. Compiled with the assistance of plant superintendents, maintenance engineers and painting foremen, the information in this booklet is based on years of experience. Send for Industrial Maintenance Series No. 9.

Bailey Meter Company, 1050 Ivanhoe Rd., Cleveland 10, Ohio—"Bailey Fluid Meters for Steam-Liquids-Gases" is the title of a revised 40-page booklet issued by this company. It is divided into ten different sections discussing flow mechanisms, primary elements, integrators, auxiliary recorders, accessories, and installation features. Photographs and drawings of the equipment discussed and diagrammatics for aid in understanding the operations are shown. Bulletin No. 301-B.

Bakelite Corporation, 300 Madison Ave., New York 17, N. Y.—A new booklet prepared by this company on its Vinylite brand Resins and Plastics will serve as a concise, informative guide and describes their forms, properties and uses, and shows how they can be utilized to assure plastic products of attractive appearance and long-lasting service. Throughout the booklet are numerous pictures, some in color, of the many plastic products.

Brooks Rotameter Co., Lansdale, Pa.—Now available free upon request is a new catalogue, which covers the full line of this company. Amplified with numerous illustrations, charts, and data sheets on rotameters for flow-rate measurement and control, this catalogue includes the "Full-View" rotameter with safety shielding for normal pressures and temperatures, the "Stain-Met" armored rotameter for high pressures and temperatures, and the "Inductronic" rotameter for remote record, automatic control or totalization of flow rates. Also described is the rotameter for purge systems, and the flow rate kit for research laboratories and pilot plants. Write to Box No. B-7648.

Clark Tractractor Div. of Clark Equipment Co., Battle Creek, Mich.—Dimensions, weights, capacities, and turning radii for all models of fork-lift trucks, towing tractors, and tractractor models are given in this new 4-page condensed catalogue. Principal specifications are summarized on both gas-powered and electric battery-powered machines. To obtain this publication, write to the Industrial Truck Division.

DeLaval Steam Turbine Co., Trenton 2, N. J.—A bulletin, No. 83-29, put out by this company, presents outstanding features of DeLaval design and construction, listing pump ratings and incorporating essential dimensions. Brief descriptions of features such as mechanical shaft seals, self-priming systems and vertical mountings are given. With this catalogue, engineers can select the required pump, estimate motor size and plan approximate installation dimensions.

The Duriron Company, Inc., Dayton 1, Ohio—An 8-page bulletin has just been issued on a high alloy low carbon austenitic stainless steel known as Durimet 20, which is recommended for use with about 125 corrosive solutions. Particular attention is given to the service of Durimet 20 where standard stainless steel may be limited in resistance to attack. Its resistance to sulfuric acid and its own limitations are thoroughly charted. Write for Bulletin 112.

Eutectice Welding Alloys Corporation, 40 Worth St., New York 13, N. Y.—Recently issued by this company are reprints of two bulletins. "Arc Welding Problems Successfully Solved," covers the welding of cast iron, low and high alloy steels, stainless steel and tool steel to high carbon steels; welding special manganese parts; elimination of undesirable characteristics; and other problems. Twelve production case histories are presented and well illustrated. The second bulletin, "Another Major Advance in Gas Welding," is on the use and application of various new developments in the field of special flux-coated alloys known as EutecRods, for steel, cast-iron, brass and aluminum. Correct welding procedures, together with physical properties, charts and valuable technical data, are included. These reprints are available on request.

Fischer & Porter Company, Hatboro, Pa.—A new bulletin from this company describes Flowrator instruments for measuring flow rate of liquids and gases. Elaborate descriptions and illustrations of instruments, both assembled and dis-assembled, are included. A horizontal line adapter is included in the numerous new accessories shown. Details for front and rear panel mounting, rear lighting arrangements, steam heating coils, and alarm devices are given. Ask for copy in care of Department 1 F-C.

General Electric Co., Pittsfield, Mass.—Ready for requests is a four-page illustrated booklet devoted to a description of G-E permanent magnet sub-assemblies. Descriptions of how the magnetic sub-assemblies eliminate assembly line rejects, the high cost of test equipment, breaking and chipping losses, and the expense of shipping semi-finished magnets are given. Ask for Booklet No. CDM-16.

B. F. Goodrich Co., Akron, Ohio—A new catalog section on its line of industrial fire hose is available upon request. The construction methods by which the hose is built, materials used, and tests made are included. Approximate data is included on the sizes, weights per 50 feet coupled and uncoupled, and initial test pressure. Information is given on couplings and rubber-covered hose in industrial plants. Ask for No. 3750.

The B. F. Goodrich Co., Akron, Ohio—A new catalogue section on its rubber mats and matting for factories, offices, stores, institutions and homes has just been published by this company. Detailed descriptions of the construction of the various products and pictures of some typical applications are shown. Copies are available upon request. Ask for Catalogue Section 6100.

The Jeffrey Manufacturing Co., Columbus 16, Ohio—Installation views showing how shredding machinery units serve various industries on a diversified line of products is featured in a new catalogue by this company. Cross-section illustrations show results achieved when machinery is in operation. Write for Catalogue 805.

William F. Klemp Co., 6636 S. Melvina Ave., Chicago 38, Ill.—A twenty-page technical manual describing the uses of and how to install floor armors and surface armors has just been published by this company. The instruction manual explains how to lay either Hexteel or Floorsteel in new concrete, over wooden floors, or old concrete or mastic. Also explained is how to repair broken or crumbling floors with the steel armors. Copies of this new catalogue can be obtained by writing the company in care of Mr. Emerson C. Whitney.

E. P. Lawson Co., Inc., 426 W. 33rd St., N. Y.—This company has prepared a six-page, two-color brochure which enumerates with illustrations the twelve features designed to insure safety, dependability, accuracy, and production for users of the Lawson 46" and 52". These booklets have been issued to Lawson distributors, or you can write direct for your copy.

Link-Belt Company, Chicago 1, Ill.—Any reader interested in the new Book No. 1815, edited by this company, may receive one upon request. The 16-page catalogue covers double and triple reduction units with integrally mounted electric motor, in standard sizes of 1 to 30 hp. with an output speed range of 280 to 6 rpm. Tabulations of the various sizes of gearmotors available is also given with dimensions and average weights; shows styles of mountings; gives load-classification and selection tables; and includes dimensions of slide rails.

Lisbon Hoist and Crane Co., Lisbon, Ohio—Details of outstanding features of the new Bob-Cat electric cable hoist are covered in a bulletin put out by this company. Features such as weight, overhead space, strength, motor, and gears are discussed, and specifications and prices and directions for ordering are given.

Magnus Chemical Company, Inc., Garwood, N. J.—This company has announced the issuance of the new "Paper Mill Cleaning Handbook," written by R. W. Mitchell, Ph.D. It presents the cleaning and related operations encountered in every phase of paper manufacture. Discussed is the nature of cleaning problems and the kind of cleaning method called for, followed by a description of the Magnus materials and methods recommended with full directions for their use. It tells how to solve the cleaning problems of the water filter plant right on through to the problems of the salvage shop, economically and efficiently. For your copy, write to Department PI.

Milton Roy Company, 1316 E. Mermaid Rd., Phila. 18, Pa.—Reprints of Technical Paper 57 are now available from this company, entitled "Controlled Volume Chemical Pumps Design and Operation" by Robert T. Sheen, reprinted from April, 1948 issue of Chemical Engineering Progress. A complete discussion of automatic chemical feed systems, their applications, and their functions is contained. Included are several illustrations and diagrams.

Northern Equipment Co., Erie, Pa.—Now available from this company is Bulletin No. 473, describing the boiler water level control at the municipal power plant, City of Monroe, La. Photos and charts are used to illustrate the booklet.

Joseph T. Ryerson & Son, Inc., Chicago 80, Ill.—An improved carbon-manganese carburizing steel, called Ryease, is described in a new bulletin put out by this company. The chemical content and the mechanical properties are given, also heat treatment specifications. Write to Box 8000-A for copies.

Schutte and Koerting Company, Phila. 22, Pa.—Illustrations and data on the SK Venturi Type Desuperheaters, the SK Surface Absorption Type, and the SK Spray Type, are combined in a new bulletin 6-D. Diagrammatic drawings and technical data are contained. Tables of dimensions, combined with an SK Desuperheater Selector Curve Chart illustrating the size desuperheater required for desuperheating steam to within fifteen degrees of saturation temperature, are also included. Copies of this bulletin are by request.

Spraying Systems Company, 4021 W. Lake St., Chicago, Ill.—Catalogue No. 23, by this company, will be of interest to all engineers and plant operating men who have to do with spraying operations. It presents the most advanced developments in pneumatic atomizing nozzles for reducing liquids of all types into uniform, atomized sprays. Cutaway illustrations reveal the details of the various types of nozzles and tables showing comprehensive capacity and spray dimension to facilitate selection.

Yale and Towne Mfg. Co., Philadelphia, Pa.—In a two-colored, 20-page bulletin, this company explains pallet-system applications, hand lift and worksaver pallet truck models, and recommended pallet design. Pictures illustrating the uses of the pallet system and drawings on pallet design are included. Cutaway illustrations of hand truck mechanisms and charts recommending the correct trucks for different uses are shown. Request Bulletin P-673.

Since 1903

ONLY FOURDRINIER AND CYLINDER WIRES . . . ONLY QUALITY WIRES . . . FOR THE PAPER INDUSTRY

THE LINDSAY WIRE WEAVING COMPANY
14001-14299 Aspinwall Avenue • Cleveland 10, Ohio

Lindsay WIRES
FOR PAPER MILLS

LEVEL VIBRATING DOUBLE DECK CHIP SCREEN

PAPERMILL AND WOODROOM Equipment

MURCO

Illustrated are some of the better known MURCO Woodroom and Papermill equipment that for years have been serving the paper industry. Write for complete details on this or any other equipment that you may be planning.

PULPWOOD CHIPPERS

MURCO HORIZONTAL AXIAL FLOW AGITATOR

MURCO VERTICAL AXIAL FLOW AGITATOR

SCREW CONVEYORS AND FLIGHTS

QUICK OPENING GATE VALVE

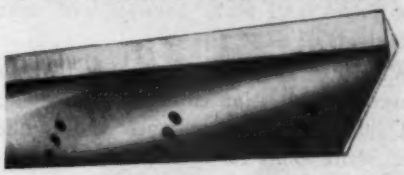
BACKED BY OVER 60 YEARS EXPERIENCE

D. J. MURRAY MANUFACTURING CO.
WAUSAU, WISCONSIN

When COSTS Look Like This . . .

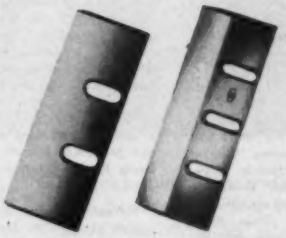
Here Are 3 Ways to Substantial Savings

● ATKINS PAPER KNIVES



Records prove that Atkins Paper Knives frequently give two to three times the service between grindings. Made of special analysis steel, specially heat-treated — then ground and honed to razor-keeness — Atkins not only stay in the cutter longer, but deliver consistently cleaner, smoother cuts throughout this extra cutting period.

● ATKINS CHIPPER KNIVES



Heat treated, hardened, tempered and ground to give you uniform, unbruised chips *without frequent grinding and with fewer knife replacements.* Atkins Chipper Knives save you money two ways: by producing better chips for longer periods; by holding knife costs to a minimum.

● ATKINS RULE

Up to 350,000 impressions reported on tough stock with absolute uniformity. Easy to work, always the same in height, temper, thickness. All types—cutting, perforating, creasing—in all sizes.

ATKINS

ATKINS

E. C. ATKINS AND COMPANY
Home Office and Factory: 402 S. Illinois Street, Indianapolis 9, Ind
Branch Factory: Portland, Oregon
Branch Offices:
Atlanta • Chicago • New Orleans • New York • San Francisco
MAKERS OF BETTER SAWS FOR EVERY CUTTING JOB

"For upwards of 25 years Hammermill Paper Company has been a member of National Safety Council. During these years we have gained much information and guidance. We know this has contributed materially toward the prevention of accidents to our employees and the public at large.
"Cooperating with them we have solved many of the Safety Engineering problems, the solution of which we believe has been of benefit to the entire pulp and paper industry."

RICHARD P. PRICE
Vice President and General Superintendent
Hammermill Paper Company
Erie, Pennsylvania

It costs a great deal more to *tolerate* accidents than to *prevent* them. The 305 members of the Council's Paper and Pulp Section will vouch for that statement!

Would you like to know how this non-profit cooperative association can help you cut accident costs and improve your employee and public relations? Then write today for full information.

NATIONAL SAFETY COUNCIL 20 N. Wacker Drive Chicago 6, Illinois

Wheelco Instruments Company, 847 W. Harrison, Chicago 7.—An attractive 20-page, three-color book, "Wheelco Electronic Controls" has just been released. Graphs, diagrams and photos are used to explain Wheelco Measuring and Control Systems; the "Electronic Control Principle"; Multronic, Proportioning, Automatic Positioning and Program Control. Millivoltmeter, Potentiometer and Resistance Thermometer Controllers are included, as well as Indicating Pyrometers and Resistance Thermometers, Input Controllers, Portable Pyrometers and Potentiometers, and Selector Switches. Combustion safeguards and auixiliary equipment are treated separately. This condensed catalogue contains listings and specifications on standard instruments. A separate four-page price list is included. This bulletin will be a welcome reference book for instrument experts as well as those who are newcomers in the field of process control. Request Bulletin No. 3-6400.

Books

Barrell's Paper Annual (Volume VII)—In this edition, the Directory of Officials of the Paper Industry has been expanded to include the following associations: The Gummed Industries Association, Inc., and the Paper and Twine Association. Three interesting feature articles, well illustrated, make up the front matter of Volume VII. These are: (1) "A Bird's-Eye View of the American Pulp and Paper Industry," by E. W. Tinker, executive secretary of the American Paper and Pulp Association; (2) "Great American Research Laboratories, (1) The Hercules Powder Company;" (3) "How Uncle Sam Buys Paper," by M. S. Kantrowitz, technical director of the United States Government Printing Office. This volume is attractively bound with a cloth cover and plastic back. Its publisher, William L. Barrell Company, Lawrence, Massachusetts, places no charge on this publication to members of the paper industry.

Communism or Capitalism: Which Way for Us?—This little booklet carries a strong message. In a dynamic way it presents to the American worker a simple, down-to-earth explanation of the mainsprings of communism and capitalism, the principles behind these opposite systems, how each developed, and what each means from the individual worker's point of view. The booklet is written by Harry D. Warren, whose famous "Sabotage" manual sold three million copies during the war. It is sold in lots and may be obtained by writing the National Foreman's Institute, Inc., Box 2, Deep River, Connecticutt.

Forestry in the South—This is the first of a series of Twelve Monographs on Southern Resources and is written by C. F. Korstian and Lee M. James. The purpose of the monographs is to place the South under the scrutiny of both natural and social scientists in an effort to discover potentialities and to point the way for wise resource development. This first book on Southern forests explores the forest resources in terms of types and volume, growth and drain. It analyzes the industrial uses of forest resources and the status of forest management. It contains numerous photographs of timber stands and plantations as well as many tables, graphs, and maps illustrating facts and conditions of Southern forests. The book is attractively printed on glossy paper and may be obtained at $1.50 per copy or less from The Southern Association of Science and Industry, Inc., Hotel Murphy, Richmond 19, Virginia.

Industrial Weighing—This 560-page book is an exhaustive treatise on virtually every weighing problem known. The book is divided into two parts, the first being a review of basic scale mechanics, of design and construction of modern scales, and of scale installation and maintenance, while the second is a very extensive treatment of the application of scales in industry. The author, Douglas M. Considine, elaborates on countless uses for scales of widely varying designs, covering mining, machinery, and metal products; chemical industries; public works, service, and transportation industries; food industries; textile and paper industries; and the rubber and plastics industries. The book is profusely illustrated, and also contains some valuable tables and a glossary. The price of the book is $10.00, and it can be obtained from the Reinhold Publishing Corporation, 330 West 42nd Street, New York 18, New York.

Practical Color Simplified—Written by William J. Miskella, M.E., E.E., this handbook has been revised and reissued in a Limited Edition after many requests. It contains all of the general and important information on color choosing, mixing, matching, and harmonizing incidental to practical finishing. Also included are numerous color charts and tables designed to simplify color selection for almost any commercial or industrial requirement. It is durably bound in wear-resistant imitation cloth. The price of the book is $5.00, and it may be obtained by writing The Miskella Infra-Red Company, Publishing Division, East 73rd and Grand Avenue, Cleveland 4, Ohio.

Practical Emulsions (Second Edition)—Concentrating on the art of making and applying emulsions, this book, by H. Bennett, technical director, Glyco Products Company, Inc., and editor of Commercial Waxes, Chemical and *Technical Dictionary*, and *Chemical Formulary*, contains a revised text of the first edition. In addition, special sections have been added on the use of soap, lecithin, and pectin as emulsifying agents, and on surface-active germicides. A symposium on industrial emulsions also has been included.

The book is made up of 34 chapters. A few of these chapters are: Types of Emulsions, Emulsifying Agents, Foams and Frothing, Stability, Dispersing Agents and Wetting Agents, Bituminous Emulsions, Defoaming Agents, Paper Processing Emulsions, Resin and Rubber Emulsions, Waterproofing Emulsions, and Wax Emulsions. The book, totaling 568 pages, is priced at $8.50 a copy. It is published by Chemical Publishing Co., Inc., 26 Court St., Brooklyn 2, N. Y.

REMOVE

SCALE,
SLUDGE,
RUST

and other
accumulation . . .
with AURAND
CLEANING TOOLS

FOR ANY HARD SURFACE:
IRON—STEEL—BRICK—CONCRETE—ETC.

It's easy to remove paint, scale, rust and other accumulations with AURAND Cleaning Tools. Powered, rotary chipping does a thorough cleaning job in less time. No special skill required. Even depth surface is assured by an adjustable shoe control. Cutter heads are renewable.

For further information write Dept. 649

AURAND MFG. & EQUIP. CO.
2643 Colerain Avenue • CINCINNATI, OHIO

A New Reprint . . .
for the Papermakers Library!

Notes and Observations on Beaters

by
B. M. Baxter, Consulting Engineer

Just published — convenient pocket-sized edition — 48 pages — 16 illustrations

$1.00 per copy — postpaid

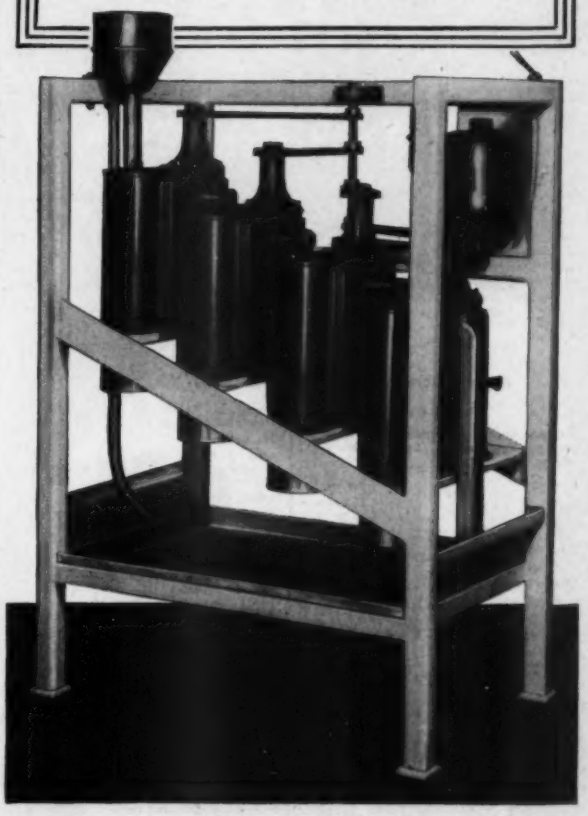
8 other publications for the Papermaker

Modern Pulp and Paper Making	$7.25
Trouble on the Paper Machine	.75
Pulp Bleaching (A Symposium)	.50
Technology of Papermaking Fibres	.50
Lessons in Paper Making—Part 1	.75
Lessons in Paper Making—Part 2	.75
Drying of Paper on the Machine	1.50
Procedure Handbook of Arc Welding Design and Practice	1.50

All available postpaid; mail check with order to

FRITZ PUBLICATIONS, INC.
59 E. Van Buren Street Chicago 5, Illinois

BAUER-McNETT FIBER CLASSIFIER



An approved and widely used laboratory device for research and control of fiber processing. More than 200 already in service.

Control accomplished by separating any sample of pulp or fluid paper stock into five fractions. Each fraction contains fibers of approximately the same length. Thus the operator obtains basic data to assist him in the investigation or regulation of stock preparation processes.

Simple... Sturdy... Self-contained and Compact.
Only 23½" x 37" floor space.

Construction, operational and other pertinent data in illustrated folder just released. *Write for it.*

THE BAUER BROS. CO.
SPRINGFIELD, OHIO, U.S.A.

Bauer

CURRENT MARKET QUOTATIONS

RAGS (Domestic)

NEW RAGS

Quotations to consuming mills, cents per pound or dollars per hundred pounds, f.o.b. New York, follow:

	per cwt.
Blue Overalls	8.75 to 9.00
Corduroy, Men's	6.50 to 7.00
Corduroy, Ladies'	6.50 to 7.00
Washables, No. 1	5.50 to 5.75
Percales	7.50 to 8.00
Light Prints, No. 1	7.50 to 8.00
Khaki Cuttings—	
Bleachable	7.25 to 7.50
Unbleachable	6.50 to 6.75
New White Canvas	12.00 to 13.00
New Mixed Blacks	5.50 to 6.00
Canton Flannels, Bleached	11.00 to 11.50
Shirt Cuttings—	
New White No. 1	11.25 to 11.75
White Shrunk	10.50 to 11.00
Silesias No. 1	8.50 to 9.00
New Unbleached	11.50 to 12.00
Fancy	6.75 to 7.00
Linen Cuttings—	
American	8.50 to 9.00
White	14.50 to 15.50
Grey	13.50 to 14.50

RAGS (Domestic)

OLD RAGS

Quotations to consuming mills, dollars per hundred pounds, f.o.b. New York, follow:

Roofing—	per cwt.
No. 1	1.75 to 1.80
No. 2	1.65 to 1.70
No. 3 and No. 4	1.45 to 1.55
Twos and Blues—	
Repacked	3.25 to 3.50
Thirds and Blues—	
Repacked	3.00 to 3.25
Miscellaneous	2.50 to 2.75
Whites, No. 1—	
Repacked	4.75 to 5.00
Miscellaneous	4.00 to 4.25
White, No. 2—	
Repacked	3.75 to 4.00
Miscellaneous	3.00 to 3.25

RAGS (Foreign)

ex dock New York City

NEW RAGS

	per cwt.
New Dark Cuttings	Nominal
New Mixed Cuttings	
New Light Silesias	
Light Flannelettes	
Unbleached Cuttings	
New White Cuttings	
New Light Oxfords	
New Light Prints	

RAGS (Foreign)

ex dock New York City

OLD RAGS

	per cwt.
No. 1 White Linens	Nominal
No. 2 White Linens	
No. 3 White Linens	
No. 4 White Linens	
No. 1 White Cottons	
No. 2 White Cottons	
No. 3 White Cottons	
No. 4 White Cottons	
Extra Light Prints	
Ord. Light Prints	
Med. Light Prints	
Dutch Blue Cottons	
French Blue Cottons	
French Blue Linens	
Checks and Blues	
Linsey Garments	
Dark Cottons	
Old Shopperies	

ROPE and BAGGING

f.o.b. and ex dock New York City

	per cwt.
Gunny No. 1—	
Foreign	Nominal
Domestic	7.25 to 7.50
Wool Tares—	
Light	7.50 to 7.75
Heavy	8.00 to 8.25
No. 1 Scrap Bagging	7.00 to 7.25
Manila Rope—	
No. 1 large	6.00 to 6.25
No. 1 small	5.00 to 5.25
New Burlap Cuttings	7.50 to 8.00
Jute Threads—	
Foreign (Nom.)	4.50 to 7.00
Domestic	6.00 to 6.50
Strings—	
No. 1 sisal	5.00 to 5.25
No. 2 sisal	4.50 to 4.75
Soft jute	4.25 to 4.50
Mixed	2.50 to 2.75

WASTE PAPER

The following are quotations, dollars per ton, for No. 1 packing f.o.b. New York:

	per ton
Shavings—	
Hard White Env. Cuts	140.00—
Hard White, No. 1	120.00—
Soft White No. 1	100.00—
Soft White, One-cut	120.00—
Soft White, Misc.	90.00—
Fly Leaf, No. 1	55.00—
Fly Leaf, Woody, No. 1	40.00—
No. 2 Mixed Col. Woody	30.00—
Flat Stock—	
No. 1 Heavy Books and Magazines	23.00 to 25.00
Mixed Books	18.00 to 19.00
Ledger Stock—	
No. 1 white	80.00 to 85.00
No. 1 Mixed (Colored)	55.00 to 60.00
Manilas—	
New Env. Cuttings	95.00 to 100.00
New Env. Cuts, One-Cut	—
Extra Manilas	—
Manila Tab Cards, Free of Ground Wood	90.00 to 95.00
Colored Manila Tab Cards	55.00 to 60.00
Kraft—	
New Envelope Cuttings	100.00 to 110.00
Trimmed Sorted No. 1 100%	60.00 to 65.00
New 100% Cor. Cuts	65.00 to 70.00
No. 1 Old Assorted	40.00 to 45.00
News—	
White Blank	75.00 to 80.00
Overissue	16.00 to 17.00
No. 1 Baled	12.00 to 13.00
Old Corrugated Containers	20.00 to 22.00
New Jute Corrugated Cuts	27.00 to 28.00
Mill Wrappers	20.00 to 21.00
Box Board Chips	9.00 to 10.00
No. 1 Mixed Paper	9.00 to 10.00

CHEMICALS

f.o.b. shipping point

Alum (Papermakers)—	
Lump, cwt.	4.25—
Ground, cwt.	4.00—
Powdered, cwt.	4.40—
Blanc Fixe—	
Pulp, bulk, ton	77.50—
Dry, barrels	85.00—
Bleaching Powder—	
Drums, cwt.	3.25 to 4.25
Casein (Domestic Standard)	
20-30 mesh (bags), lb.	
80-100 mesh (bags), lb.	31.00 to 32.00
Argentine, lb.	28.00 to 29.00
China Clay—	
Domestic Filler Bulk (mine) ton	10.00 to 15.00
Domestic Coating Bulk (mine) ton	15.00 to 25.00
Imported (ship side) Bulk (lump) ton	22.00 to 30.00
Chlorine—	
Tank cars (wks) cwt.	2.40 to 2.70
Gelatine (silicin), lb.	1.60 to 1.65
Glyc. (C.P.) drums, lb.	39½ to .40
Litharge, powd., bbl., lb.	19¼ to 20¼
Rosin (Gum)—	
New York, per 100 lbs.	
E	8.45—
F	8.45—
G	8.55—
WW	8.80—
Rosin (Wood), carlots	6.50—
Salt Cake—	
Dom. bulk (wks) ton	20.00 to 25.00
Imp. bulks on dock— (All. ports) ton (Nom.)	25.00 to ———
Soda Ash—	
Bulk (works), cwt.	1.10 to 1.20
Paper Bags, cwt.	1.25 to 1.35
Barrels, cwt.	1.35 to 1.60
Soda (Caustic)—	
Solid drums, cwt.	2.85 to 3.05
Ground and flake, drums, cwt.	3.25 to 3.50
Sodium Silicate—	
60 deg., 55 gal. drums, (works) cwt.	1.65 to 2.05
40 deg., 55 gal. drums, (works), cwt.	.80 to 1.45
Starch—	
Pearl, 140 lb. bags, cwt.	7.00—
Pearl, barrels, cwt.	7.00—
Paper, (Sp.) bags, cw.	7.00—
Powdered, barrels, cwt.	7.12—
Sulphur (Crude)	
(Mine) bulk, long ton	16.00 to 18.00
Talc—	
Dom. 100 lb. bags (mine) ton	20.00 to 28.00
Canadian	35.00 to 45.00
Titanium Dioxide—	
Barium Pig, bbls., lb.	18 to .18½
Calcium Pig, bbls., lb.	18 to .18½
Zinc Sulphide, bbls., lb.	11.50 to 11.75

WOOD PULP

Prices, dollars per short, air dry, ton, on dock American ports and f.o.b. shipping points with former OPA freight allowances, are:

Bleached sulphite, Swedish	185.00 to 195.00
Bleached sulphite, Finnish	187.50—
Bleached sulphite, dom.	126.00 to 135.00
Easy bleaching sulphite	—
Unbleached sulphite, Swed.	155.00 to 165.00
Unbleached sulphite, Fin.	155.00 to 157.00
Unbleached sulphite, dom.	125.00 to 130.00
Unbleached kraft, Swedish	147.50—
Unbleached kraft, Finn.	147.50—
Unbleached kraft, northern	125.00 to 135.00
Unbleached kraft, southern	110.00 to 125.00
Bleached sulphate, Swedish	185.00 to 190.00
Bleached soda, domestic	130.00 to 135.00
Sulphite screenings, dom.	60.00 to 70.00
Sulphate screenings, dom.	60.00 to 70.00
Groundwood, domestic and Canadian	80.00 to 85.00

PAPER

f.o.b. New York City

Boards—	per ton
Binders	94.00—
Chip	90.00—
Chip, tube and can	95.00—
Chip, full blanding	97.50—
Chip, sgl. mls. lined	95.00—
Coated, white patent .018	120.00—
.020 and heavier	110.00—
Kraft liner	79.00—
Filled News	90.00—
Container	90.00—

Book Papers—f.o.b. mill with quantity, weight, manufacturing and other differentials allowed:

(Per cwt. in ton lots)

Uncoated (Untrimmed)

Book, White (M. F.)—	
A Grade E. F.	14.25—
B Grade E. F.	13.20—
C Grade E. F.	—
D Grade E. F.	—
No. 2 Uncoated Offset 4 sides, White	—
Machine Coated White (Trimmed 4 sides)	
No. 1 Glossy	19.55—
No. 2 Glossy	18.20—
No. 3 Glossy	17.00—
No. 4 Glossy	—
No. 2 Offset	14.00—
C1S Litho (Varnish)	—
C1S Litho (Non-Varnish)	—

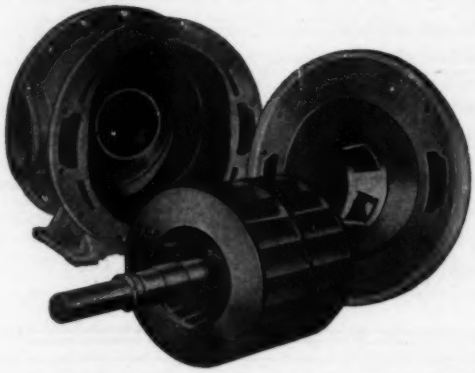
Writing Papers—f.o.b. mill with zone, quantity, packing and other differentials allowed:

Rag Content Bond—	per cwt.
(In Ton Lots)	
Extra 100% Rag	48.70—
100% Rag	42.70—
75% Rag	33.10—
50% Rag	28.25—
25% Rag	25.10—

Rag Content Ledger—	per cwt.
(In Ton Lots)	
Extra 100% Rag	48.70—
100% Rag	42.70—
75% Rag	33.10—
50% Rag	28.25—
25% Rag	25.10—
Sulphite Bond—	per cwt
Air dry, watermarked	—
No. 1 watermarked	18.50—
No. 2 watermarked	17.55—
No. 4 watermarked	16.85—
Sulphite Ledger—	per cwt Zone 1
No. 1 watermarked	18.85—
No. 2 watermarked	18.05—
No. 4 watermarked	17.35—
Glassine (f.o.b. mill)—	per cwt
Embossed (25 lbs. up)	—
Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
Greaseproof— Bleached (25 lb. up)	—
Unbleached (25 lb. up)	—
News—	per ton
Rolls, Standard (Contract)	90.00—
Rolls (Spot)	(Nominal)
Sheets	115.00—
Tissues (Carlots)—	per ream
White No. 1	1.85—
White No. 2	1.75—
Bleached Anti-Tarnish	—
Colored	—
Anti-Tarnish Kraft	1.85—
Manila	1.60—
Napkins, semi-crepe (12½ lb. to M shts.) per cs.	.80—
Napkins, full crepe and emb'rad (12½ lb. to M shts.) per cs.	.80—
Toilet, Bleached (M. shts.) per cs	8.50 to 10.00
Toilet, Unbleached (M. shts.) per cs	8.50 to 10.00
Towels—	per case
Bleached	4.75—
Unbleached	4.00—
Wrappings (Kraft)—	per cwt.
Super-Standard	9.00 to—
No. 1 Wrapping	7.25 to 8.00
Standard Wrapping	6.50 to 7.00
Standard Bag	6.50 to 7.00
Variety Bag	—

Wrappings (Sulphite and Bleached Kraft)— (Rolls, f.o.b. mill)	
Bleached Papers—	per cwt.
M.F. & M.G. Waxing, 20 lb. (Carloads only (10,000 lbs.)	—
Drug wrapp., 35 lb.	—
Unbleached Papers—	
Com. Gr. Butch. 40 lb.	—
No. 1 Butchers	—
No. 1 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
No. 2 Imit. Parch & Dry Fin. Groc. Sulphite, 30 lb.	—
Steam Finish, 50 lb.	—
Water Finish, 50 lb.	—
Manilas—	
Envp. Mls., Sub. 16-40 (No. 1)	—
Envp. Mls., Sub. 16-28 (No. 2)	—
Envp. Mls. (Prices based on large sheets untrim'd ream-marked, in bdls.)	
Wrapp. Mls. 35 lb. up—	
No. 1	—
No. 2	—
M.G. Sulphite and Kraft (other than Waxing)	
Grade B20 lb.	—
Grade A-22 lb.	—

SIMPLICITY



NASH VACUUM PUMPS HAVE ONE MOVING PART

Operating advantages made possible by the Nash principle, and present in no other type of vacuum pump, permit a new level of operating economy. Nash Vacuum Pumps have but one moving part, a rotor cast in one piece, and revolving without metallic contact. There are no valves, no pistons or sliding vanes, no internal parts requiring wear adjustment or lubrication.

NASH ENGINEERING COMPANY
SOUTH NORWALK, CONNECTICUT, U. S. A

HARDY S. FERGUSON & COMPANY

CONSULTING ENGINEERS

200 FIFTH AVENUE NEW YORK 10, N. Y.

Consultation, reports, valuations, and designs for the construction and equipment of

PULP AND PAPER MILLS
STEAM AND HYDRO-ELECTRIC POWER PLANTS
DAMS AND OTHER HYDRAULIC STRUCTURES

COLORS . . .
for Board and Paper

Green Chromium Oxides
Black, Brown, Red, Yellow Iron Oxides
Lamp Black—Umbers—Venetian Reds
Yellow Ochres

C. K. WILLIAMS & CO.

Easton, Pa. - East St. Louis, Ill.
Emeryville, Calif.

Solving Speed-Control Problems

is work for specialists

When you look to Lewellen you employ the pioneer* in speed-control

*Speed Control exclusively for more than 45 years

Wire, phone or write
LEWELLEN MFG. CO.
Columbus, Indiana

LEWELLEN

Variable-Speed

TRANSMISSIONS – MOTOR PULLEYS

"WHERE *Good Connections* COUNT"

NEW DEVELOPMENTS OF ROTARY UNIONS SAVES TIME—POWER—MONEY

The ALL PURPOSE Ball-Bearing ROTARY UNION for dryers, calenders and cooling rolls in the paper industry is hardly more than a handful for size yet it does a mighty job in cutting installation and service costs . . . in saving power, because of less friction drag . . . in saving machine down time, quick and simple connecting and disconnecting. No complicated piping and supports.

The ALL PURPOSE Ball-Bearing ROTARY UNION is now even more outstanding, with newly developed features such as: Monel bellows . . . silver soldering for high temperatures . . . special graphite seal, absolutely pressure tight . . . extended seal face, seal face pressure proportional to fluid pressure . . . and many others. Plain or syphon heads. Write for new Bulletin No. 400.

PERFECTING SERVICE COMPANY
6140 Cottage Grove Ave., Chicago 37, Ill.
Agents in principal cities and Canada

OPPORTUNITY

Well established manufacturer of Refiners has opening as a Sales Engineer for a man with a practical and technical background in the manufacture of pulp and paper. In addition to having the necessary operative background, the man must have sales ability, although actual sales experience not necessary; must be of highest integrity, and must be willing to travel extensively. Remuneration will be in direct proportion to the man's background and probable productiveness. Earnings would definitely be in higher brackets. Address replies to Box 471, Fritz Publications, Inc.

OPPORTUNITY

Opening for a man of executive editorial capacity, having practical and technical background in the manufacture of pulp and paper, on staff of old, established publication serving the Pulp and Paper Industry. Address inquiries and communications to Box 461, Fritz Publications, Inc.

WANTED—Mechanical engineer with wide experience in paper processing machine design. Permanent position with old established firm located in attractive residential community. Address Box 469, Fritz Publications, Inc.

WANTED—Will buy pulp and/or paper mill or plant converting to standard paper products. Address Box 470, Fritz Publications, Inc.

WANTED—Recently graduated chemical engineer or equivalent for technical control and to assist research in small stable specialty mill near Albany, N. Y. Address Box 472, Fritz Publications, Inc., stating qualifications and expected salary.

FOR SALE—New, unused surplus equipment for sale at less than cost. Stainless and carbon steel stills, pumps, instruments, motors, etc. Complete list available. Address Box 473, Fritz Publications, Inc.

FOR SALE—One #179—126" Bridgeport Heavy Duty Knife and Face Grinder, with 26" sectional wheel driven by 20 hp. 220-440 volt, 3-phase, 60 cycle motor. Table arranged with three "T" slots on carriage and driven by gear unit drive. All necessary splash guards, guard for grinding wheel, wheel dresser, coolant pump and tank, motors and starters included. Also fixture for holding bars ¾" x 2¼". Machine used only ten hours; bought new. Machine available at reasonable concession below list prices. Address Foster Machine Company, Westfield, Massachusetts.

Sandy Hill
IRON & BRASS WORKS
PAPER MACHINERY SPECIALISTS • HUDSON FALLS, N. Y.
BUILDERS OF SANDY HILL, BERTRAMS AND KAMYR EQUIPMENT

HARDINGE
WATER AND WHITE WATER TREATING EQUIPMENT
OUR BUL. NO. 46—ALSO SEE YOUR PAPER AND PULP MILL CATALOGUE
HARDINGE COMPANY, INC., YORK, PENNA.

Index to Advertisers

When writing them please mention The Paper Industry and Paper World.

Refer to the Paper and Pulp Catalogue and Engineering Handbook at your mill office, for complete listing of all advertisers' products

Adell Chemical Company 649
Advance Solvents & Chemical Corporation
Allis-Chalmers Mfg. Co. 529
Alloy Steel Products Company
American Brake Shoe Company 611
American Hoist & Derrick Co.
American Key Products, Inc. 624
American Lumber and Treating Co.
American Manganese Steel Div., American Brake Shoe Co.
American Pulp & Paper Mill Superintendents Association, Inc. 639
Ames Company, B. C.
Anheuser-Busch, Inc. 550
Appleton Machine Co., The 537
Appleton Wire Works, Inc.
Appleton Woolen Mills 633
Armour and Company
Armstrong Machine Works 591
Askania Regulator Company
Asten-Hill Mfg. Co. 622
Atkins and Company, E. C. 651
Aurand Mfg. & Equipment Co. 653
Aurora Pump Company 638

Bagley & Sewall Co., The
Bailey Meter Company 552
Baldwin-Duckworth Div. of Chain Belt Company 602-603
Barrell Co., William L. 537
Bauer Bros. Co., The 653
Beloit Iron Works 497
Bird Machine Company
Black-Clawson Co., The 531
Bowser, Incorporated 649
Bowsher Co., The N.P. 647
Bridgeport Safety Emery Wheel Co. 521
Brookfield Engineering Laboratories 624
Brown Instrument Co., The
Butterworth & Sons Company, H. W. 643

Cambridge Instrument Co., Inc.
Cameron Machine Co.
Carthage Machine Co.
Chain Belt Company 602-603
Cheney Bigelow Wire Works ..... 4th Cover
Chicago Bridge & Iron Company
Chicago Electric Company
Chicago Metal Hose Corp. 539
Chromium Corp. of America
Clark Tructractor Division of Clark Equipment Company 597
Classified Advertising 656
Coes Company, Loring 645
Continental Foundry & Machine Co.
Cooper Alloy Foundry Co., The
Cornwell Chemical Corporation
Crane Co. 612

Darnell Corporation, Ltd. 642
Dempster Brothers, Inc. 586-587
DeZurik Shower Company
Diamond Metal Products Co. 649
Dicalite Company, The 645
Dilts Machine Works 531
Disston & Sons, Inc., Henry
Dodge Manufacturing Corporation
Dow Chemical Co., The 503
Downingtown Mfg. Co. ..... 1st Cover
Draper Brothers Company 593
du Pont de Nemours & Co., E. I.
Duriron Co., Inc., The

Eastwood-Nealley Corporation 636
Ebco Manufacturing Co. 625
Economy Pumps, Inc.
Electric Machinery Mfg. Co. 595
Electric Steel Foundry 525
Electro-Alloys Div., American Brake Shoe Company 611
Elwell-Parker Electric Co., The
English China Clays Sales Corp. 632

Farris Engineering Corp.
Ferguson & Co., Hardy S. 655
Fischer & Porter Company
Fitchburg Screen Plate Co., Inc.
Fleishel Lumber Company 474
Fletcher Sales Co.
Flexible Steel Lacing Co. 643
Foxboro Company, The 382
Fritz Publications, Inc. 653, 658

Garlock Packing Co., The 647
General American Transportation Corporation 594
General Chemical Division, Allied Chemical & Dye Corporation 507
Glidden Company, The
Gould's Pumps, Inc. 510
Grinnell Company, Inc. 519

Hanchett Manufacturing Co.
Hardinge Company, Incorporated 656
Hardy & Son, George F. 630
Harrington & King Perforating Co.
Harris-Seybold Company
Hercules Powder Company 511
Heresite & Chemical Company
Hermann Mfg. Company, The 643
Hills-McCanna Company
Holyoke Machine Company 637
Hooper & Sons Co., Wm. E. 599
Hudson-Sharp Machine Company 641
Hunt Machine Co., Rodney
Huyck & Sons, F. C.

Improved Paper Machinery Corp. 558-559
Infilco, Incorporated 544
Ingersoll-Rand Company
International Nickel Co., Inc. 545

Jeffrey Mfg. Co., The
Jenkins Bros.
Jenssen Company, Inc., G. D. 647
Johnson Corporation, The
Jones & Sons Company, E. D. 506
Jones Foundry & Machine Co., W. A.

Kalamazoo Tank & Silo Co. 621
Kelco Company 560
Klipfel Manufacturing Co.
Koppers Company, Inc., Fast's Coupling Department

Langston Co., Samuel M. ..... 3rd Cover
Lawton Company, The C. A. 634
Layne & Bowler, Inc. 628
Lewellen Manufacturing Co. 655
Lindsay Wire Weaving Co., The 651
Link-Belt Company 555
Lockport Felt Company 589
Lodding Engineering Corp.
Lukens Steel Company and Divisions 516, 609
Lukenweld Division of Lukens Steel Company 609
Lunkenheimer Co., The 561

Magnus Metal Corporation 627
Maine Development Commission
Marathon Corporation
Mathieson Chemical Corporation 590
Michigan Pipe Company
Michigan Steel Casting Co. 629
Midwest-Fulton Machine Co.
Midwest Piping & Supply Co., Inc.
Milton Roy Company
Mission Manufacturing Company
Moore & White Company
Morey Paper Mill Supply Co.
Mt. Vernon-Woodberry Mills, Inc. 523
Murray Mfg. Co., D. J. 651

Nash Engineering Co., The 655
National Aluminate Corporation
National Safety Council, Inc. 652
Naylor Pipe Company 623
Nopco Chemical Company 543
Norma-Hoffman Bearings Corp.
Northwest Engineering Co. 607
Norton Company

Oakite Products, Inc. 641
Ohio Injector Co., The
Oliver United Filters, Inc. 547
Orr Felt & Blanket Co., The
Owen Bucket Company, The 634

Paper & Industrial Appliances, Inc.
Patterson Foundry & Machine Co.
Peerless Pump Div., Food Machinery Corporation
Perfecting Service Company 656
Perkins & Son, Inc., B. F. 508
Permutit Company, The
Phoenix Gage Company, The 630
Photovolt Corporation 645
Pittsburgh Piping & Equipment Co.
Poole Foundry & Machine Co. 641
Powell Company, The Wm. 548
Pusey & Jones Corp., The 517

Reading Chain & Block Corp. 626
Reliance Electric & Engineering Co.
Resinous Products & Chemical Co. ..... 2nd Cover
Rice Barton Corporation 549
Rogers & Co., Samuel C. 619
Roofing Machinery Mfg. Co. 592
Ross Engineering Corp., J. O.
Ross Heater & Mfg. Co., Inc. 512
R-S Products Corporation
Ryerson & Son, Inc., Joseph T. 562, 637

Sandusky Foundry & Machine Co.
Sandy Hill Iron & Brass Works, The 656
Seneca Coal & Iron Corp. 620
Shartle Bros. Machine Co. 531
Shuler & Benninghofen 541
Simonds Saw & Steel Company
Smith & Winchester Mfg. Co. 647
Smith Corporation, A. O.
Solvay Sales Division, Allied Chemical & Dye Corporation
Sprout-Waldron & Co. 533
Standard Oil Co. (Indiana) 535
Stebbins Engineering & Mfg. Co. 631
Stein, Hall & Company, Inc.
Stickle Steam Specialties Co. 619
Sutherland Refiner Corporation 499
Syco Manufacturing Company 502

Thwing-Albert Instrument Company 622
Timken Roller Bearing Co., The 513
Titanium Pigment Corporation
Torrington Co., Bantam Bearings Division 498
Trent Tube Manufacturing Co. 556
Tri-Clover Machine Company 509
Turner Halsey Company 523

Union Pacific Railroad Company 615
U.S.A.—Treasury Dept. 617

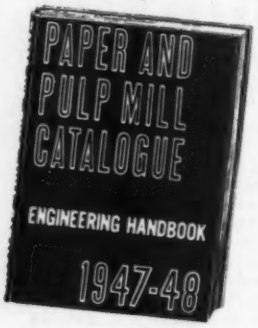
Valley Iron Works Company
Vanderbilt Co., Inc., R. T.

Waldron Corporation, John
Warren Steam Pump Co., Inc. 551
Waterbury & Sons Co., H. 649
Waterbury Felt Co., The
Western Precipitation Corp.
Weyerhaeuser Timber Co.
Wheeler Roll Company, The 635
Williams and Co., C. K. 655
Williams-Gray Company
Worthington Pump & Machinery Corporation
Wyandotte Chemicals Corporation 587

Yarnell Waring Company 505

the

1947-48



PAPER AND PULP MILL CATALOGUE
ENGINEERING HANDBOOK

NOW AVAILABLE
AT YOUR MILL OFFICE

COMPLETE CROSS-INDEXED BUYER'S GUIDE

Complete cross-indexed buyer's service listing sources of purchase of machinery, equipment, chemicals and supplies and other important information.

BIGGER—BETTER CATALOGUE SECTION

Prominent manufacturers of pulp and paper mill equipment and supplies present in these descriptive pages important information about their products.

INCREASED—VALUABLE ENGINEERING DATA

Pertinent tables, charts and other authoritative data relative to the proper operation and maintenance of pulp and paper mills.

These firms describe their products in the 1947-48 edition

Allington & Curtis Mfg. Co.
Allis-Chalmers Mfg. Company
American Cyanamid Company (Industrial Chemicals Div.)
American Defibrator, Inc.
Appleton Machine Co., The
Armstrong Machine Works
Atkins and Company, E. C.
Atlantic Steel Corporation
Aurora Pump Company

Bagley and Sewall Co., The
Baldwin-Duckworth Div. of Chain Belt Co.
Bauer Bros. Company, The
Becco Sales Corporation
Beloit Iron Works
Biggs Boiler Works Co., The
Bird Machine Company
Black-Clawson Co., The
Blaw-Knox Div. (Blaw-Knox Co.)
Bowser, Inc.
Buckman Laboratories, Inc.
Buffalo Forge Company
Buffalo Pumps, Inc.
Buflovak Equipment Division of Blaw-Knox Co.
Bulkley, Dunton Pulp Co., Inc.

Cameron Machine Company
Carbonite Metal Company
Carthage Machine Company
Cash Company, A. W.
Chain Belt Co. of Milwaukee
Chemipulp Process Inc.
Chicago Bridge & Iron Co.
Chicago Electric Co.
Cincinnati Grinders Inc.
Cincinnati Milling Machine Co.
Clark-Aiken Co., The
Control Equipment Corp.
Crane Co.

Deublin Company
DeZurik Shower Company
Dilts Machine Works
Downingtown Mfg. Co.
Dresser Industries, Inc.
Duriron Co., Inc., The

Electric Steel Foundry
English China Clays Sales Corp.

Fabri-Metals, Inc.
Falk Corporation, The
Farrel-Birmingham Co., Inc.
Fitchburg Screen Plate Co., Inc.
Fleishel Lumber Company
Foote Bros. Gear and Machine Corporation
Foxboro Company, The
Fuller Brush Company, The

Garlock Packing Company, The
Gates Engineering Company
General American Transportation Corporation
Gibbs-Brower Company, Inc.
Glens Falls Machine Wks., Inc.
Glidden Company, The
Golden-Anderson Valve Specialty Co.
Goslin-Birmingham Manufacturing Co., Inc.
Graver Tank & Mfg. Co., Inc.
Gruendler Crusher & Pulv. Co.
Gwilliam Company, The

Hanchett Manufacturing Co.
Hardinge Company, Inc.
Harris-Seybold Company
Hauser-Stander Tank Co., The
Hendrick Manufacturing Co.
Hercules Powder Co., Inc.
Hermann Mfg. Co., The
Hills-McCanna Company
Holyoke Machine Company
Hudson-Sharp Machine Co.
Hyster Company

Improved Paper Mchy. Corp.
Infilco Inc.

James Mfg. Co., D. O.
Jeffrey Manufacturing Co., The
Johns-Manville
Johnson & Carlson
Johnson Corporation, The
Jones & Sons Company, E. D.
Jones Fdry. & Mch. Co., W. A.
Joy Manufacturing Company

Kalamazoo Tank & Silo Co.
Kohler System Company, The
Koppers Company, Inc. (Fast's Coupling Dept.)

Lancaster Iron Works, Inc.
Langston Company, Samuel M.
Lawrence Mch. & Pump Corp.
Leader Iron Works, Inc.
Link-Belt Company
Lovejoy Flexible Coupling Co.

Mason-Neilan Regulator Co.
Maxson Automatic Mchy. Co.
Merrick Scale Mfg. Co.
Michigan Pipe Company
Monsanto Chemical Company
Morris Machine Works
Moyno Pump Div., Robbins & Myers, Inc.
Murray Mfg. Co., D. J.

National Aluminate Corp.
National Casein Sales
Naylor Pipe Company
Nekoosa Foundry & Machine Works, Inc.
Nichols Engineering & Research Corp.
Noble & Wood Machine Co.
Northern Engineering Works

Ohio Grease Company, The
Oliver United Filters, Inc.

Paper and Industrial Appliances, Inc.
Paper Makers Chemical Dept., Hercules Powder Co., Inc.
Perfecting Service Company
Perkins & Son, Inc., B. F.
Pittsburgh Piping & Equip. Co.
Porter Company, Inc., H. K.
Pusey & Jones Corp., The

Record Foundry & Machine Co.
Reichhold Chemicals, Inc.
Research Corporation
Rice Barton Corporation
Robbins & Myers, Inc.
Roots-Connersville Blower Corp.
Ross Engineering Corp., J. O.

Sandy Hill Iron & Brass Works
Seybold Division, Harris-Seybold Company
Shartle Bros. Machine Co.
Simpson Co., The Orville
Sinclair Company, The
Smith Corporation, A. O.
Spraying Systems Company
Sprout-Waldron & Company
Stainless Steel Division, Pittsburgh Piping & Equip. Co.
Stebbins Engrg. & Mfg. Co.
Swenson Evaporator Company
Syco Manufacturing Corp.

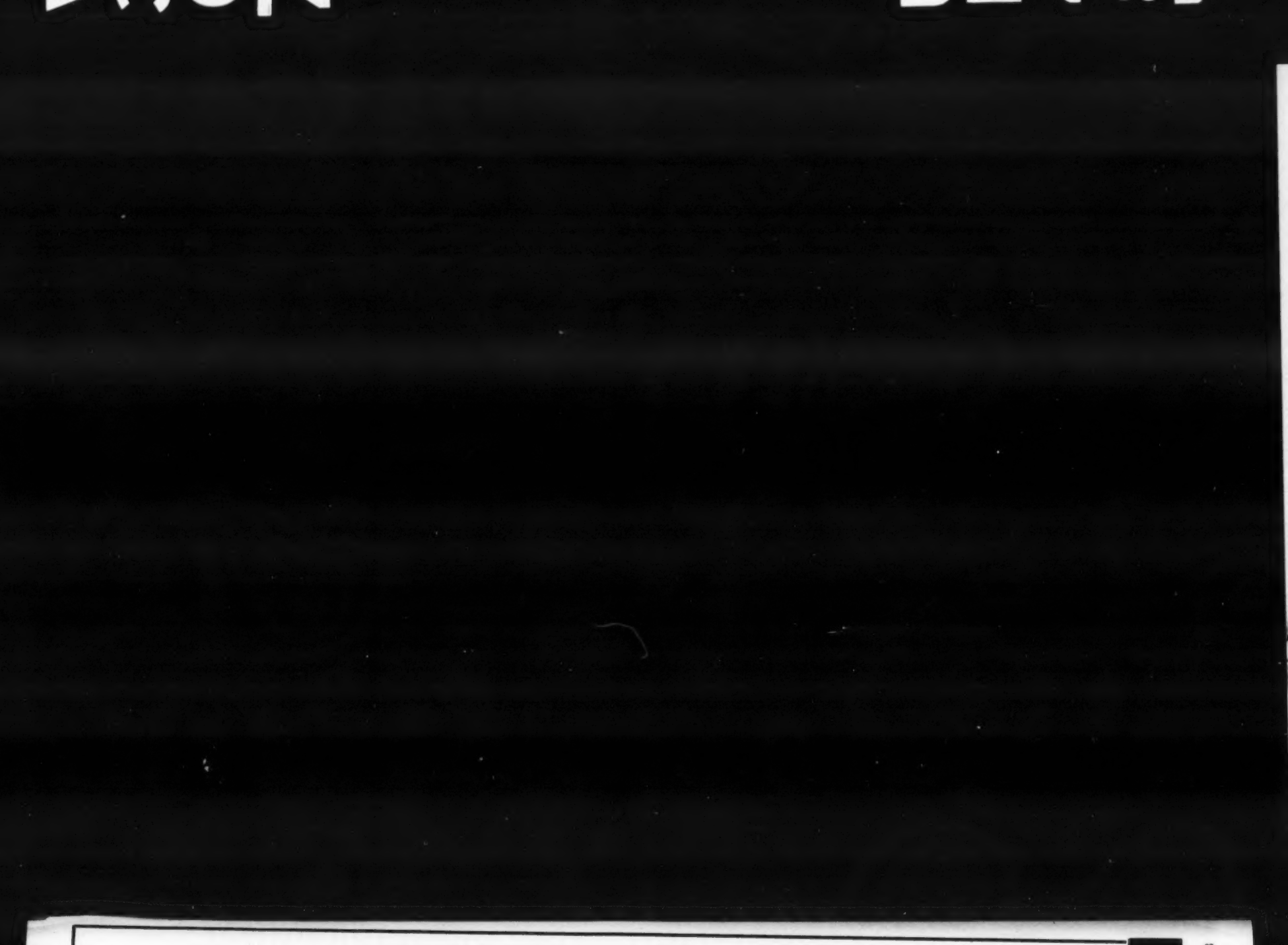
Taylor Forge & Pipe Works
Thwing-Albert Instrument Co.
Trent Tube Manufacturing Co.
Trimbey Machine Works
Tube Turns, Inc.

Valley Iron Works Company

Waldron Corporation, John
Wallace & Tiernan Co., Inc.
Westinghouse Electric Corp.
Whiting Corporation
Wiley Alloy Tube Company
Wolferz Alloy Equipment, E. C.

Mention the PAPER AND PULP MILL CATALOGUE when making inquiries.

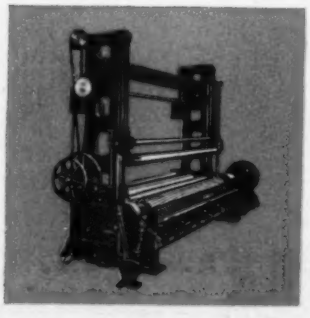
FRITZ PUBLICATIONS, Inc. 59 East Van Buren Street CHICAGO, ILLINOIS



Long life

New mounting and adjustment of the slitter elements greatly reduce thread-up time on Langston Slitters and Roll Winders. Helical nitrided gears used in the drive train assure a more silent drive. These and other improvements make Langston Winders stand up under a long life of dependable, trouble-free service.

Samuel M. Langston Company, Camden, N. J.



Langston

SLITTERS AND ROLL WINDERS

You wouldn't drive with your brakes on... or would you?

Why brake your cylinders with a seal that drags? It's really tough on the felts because they deserve a longer and fuller life. It's easier on your pocketbook and your disposition if you adopt the Cheney Bigelow cylinder seal.

This new type seal eliminates the braking action of the usual felt seal, eases the pull on the felt, reduces stretch and helps keep the felt open It saves washing-up time because you just loosen and wash out, and it makes frequent replacements a thing of the past

Write for full information about this new way to get longer felt life. Cheney Bigelow Wire Works, 817 Liberty Street, Springfield, Mass.

CHENEY BIGELOW

Pulp and Paper Mill Equipment

Fourdrinier Wires Dandys Cylinders Wire Cloth